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TRAVELS IN SIBERIA:

INCLUDING EXCURSIONS

NORTHWARDS, DOWN THE OBI,

TO

THE POLAR CIRCLE,

AND SOUTHWARDS,

TO

THE CHINESE FRONTIER.

BY

ADOLPH ERMAN.

VOL. II.

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LONDON:
SPOTTISWOODE and SHAW,
New-street-Square.

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TRANSLATED FROM THE GERMAN,

BY

WILLIAM DESBOROUGH COOLEY.

IN TWO VOLUMES.

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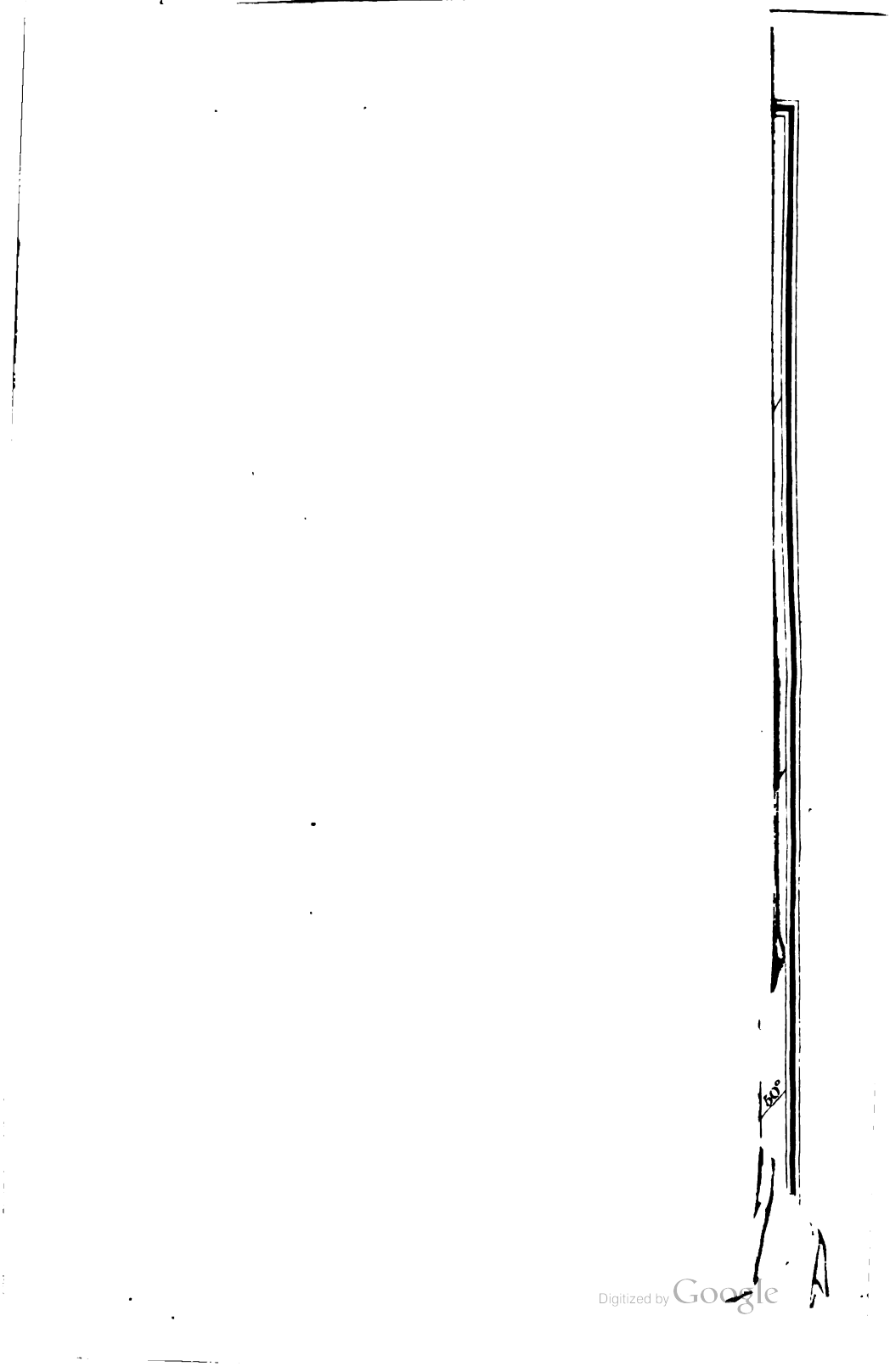
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TRAVELS IN SIBERIA.

CHAPTER I.

DEPARTURE FROM BERESOV. — USTSOSVINSK. — MORTALITY AMONG THE FISH. — TAGINSK. — LANGUAGE USED WITH HORSES. — MODE OF YOKING THE REIN-DEER. — OSTYAK SNUFF-TAKING. — KACHEGATSK. — MAGNETICAL OBSERVATIONS. — VEGETATION. — WINTER TENTS. — TATTOOING. — HUNTERS OF KEEGAT. — MUSHI. — LENGTH OF THE DAY. — FISHING THROUGH THE ICE. — SHURUSHKAR. — PARHELIA. — VANDIASK. — OSTYAK PRESENTS. — OVERSETTING OF THE SLEDGES. — ARRIVAL IN OBDORSK.

December 3. — THE temperature of the air to-day, with a west wind and clear sky, was —21° R. We prepared for our departure, and got some alterations, which were thought necessary, made in our vehicles. We left behind us, in Beresov, the larger of our two sledges, which was not fit for rein-deer, and, instead of it, we obtained through M. Bergúnof a second covered nart, the body of which was lined with rein-deer skin, together with another open sledge, of the same length, but narrower.

The first stage, fifty versts northwards from Beresov, we travelled with horses. We started on our journey about two P. M. (14 minutes before sunset), and stopped to rest about half-way at the yurts of Ustsósvinsk, which, as their name imports, are situate near the mouth (ústya) of the Sosva, where it joins the Obi. This place is surrounded by a thick and very tall wood, in which, as I was informed, the *pinus cembra* predominates.

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We found the Ostyaks of Ustsósvinsk in the yurt, hard at work before the chubàl, making a fish-basket or crate. They gave it the same shape which is usual in Europe; but, as it was intended for the sturgeon fishery, it was eight feet high and about four feet wide. In the absence of pliant rods of sufficient length, the men slit with great dexterity a larch stake into thin, and therefore flexible, laths. The roots of the pinus cembra served to bind the work. The mouth of the Sosva, like those of the other Uralian streams which descend into the Obi, is of the greatest importance for the fishery, for in December all the fish which ascend from the sea turn westwards towards the sources, and remain up these rivers till spring. With respect to all other portions, however, of the Obi and its tributary waters, the Ostyak and Russian fishermen agree in asserting that they lose their inhabitants, the fish in them dying about the beginning of January. The rivers then die off (to use their expression), and living places are to be found only in the vicinity of the springs. They talk of the samòr or convulsions, and also of the blast or vapour, as of some peculiar deadly principle which comes upon the fish and destroys them, either when at liberty or when taken in the falls. They suppose that the water then acquires a quality poisonous to the fish, though to the eye and taste it has undergone no change, and produces no effect on the men who drink it. It may be reasonably conjectured that the river-water under the ice gradually loses the air necessary for the support of life; but some different explanation seems to be required for the suddenness of the effect, and also on account of the remark of the fishermen that the samòr is more or less delayed and checked in its operation wherever springs enter the Obi, whereas it is particularly fatal in waters issuing from bogs and stagnant

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lakes. I had subsequently an opportunity of convincing myself of the existence of a similar mortality among the fish at the breaking up of the ice in the rivers which enter the sea of Okhotsk; and when I come to describe those circumstances, and also the remarkable spawning places of the Kamchatkian salmon, I shall mention many particulars which bear upon the question.

From Ustsosvinsk, and still further down towards Obdorsk, we travelled constantly on the left half of the stream, or what is called the little Obi; for it is only on the western bank, which is invariably covered with wood, that the possessors of rein-deer remain in winter. In summer a few of them go with the herds of deer further up the country, to the mossy mountain tracts, while the rest of the population betake themselves, for the sake of fishing, to the fixed yurts on the right bank of the great Obi. In these places dwell also the crews of Russian merchants from Tobolsk, partly with the view of earning money as boatmen, and partly for the purpose of fishing in places where, as they pretend, they have bought the right from the Ostyaks.

About midnight we arrived at the winter yurts of Taginsk, which, like those of Sosvinsk, are situate in the middle of the wood. Here we were to get the first reindeer. Some of the men were sitting before the bright, sparkling fire, with the upper part of their bodies bare, that they might warm themselves thoroughly previous to their night's rest; the others got up, naked in like manner, from the berths where they had already lain down under rein-deer skins. They instantly dressed themselves, and went out to catch the rein-deer, of which it was said, that they had gone far off to-day, because, "on account of the thinness of the snow (beyond the surrounding wood), moss was to be found." We staid in the yurts with the

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women, who hospitably spread fresh and clean rein-deer skins for us to lie down. These yurts seemed constructed only for temporary occupation, for the outer walls were not built with logs or stems of trees, but only of strong planks, such as are generally employed for partitions. Yet these habitations were far more agreeable and more ornamented than any fisherman's abode which I saw above Beresov. It is possible that the novelty of the fresh rein-deer skins, which have a very pleasing smell, may have helped to strengthen this impression.

December 5. — An hour probably elapsed before the cry of the drivers was heard at a distance through the wood. It was a hollow-sounding hoo! hoo! proceeding from many voices, and growing louder as it approached. Soon after we could distinguish the peculiar clattering of the feet of the running herd. Going now in front of the yurt, we saw the timid animals in full gallop, coming together from different quarters. When the drivers' cry ceased, they stood quiet near the house, still seeking their food under the snow. The men then uncoiled a long cord of leather, and held it from hand to hand, about three feet above the ground, forming a circle round the herd, which they gradually contracted, until all the animals were at last clustered close together. Then a few men went inside the ring, and catching by the antlers the deer destined for the yoke, they tied them to the cord, until a considerable number had been thus selected. A few only had a log fastened to their necks, until the sledge was got ready. This mode of proceeding would have been utterly impossible, if the half-tamed animals did not evince an instinctive tendency to subjection. A well-aimed blow with antlers four feet long would certainly be fatal; but neither when they were first caught, nor afterwards when I examined their mouths, as is done with horses, and

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lifted up their forelegs, did they offer the least resistance. Neither did any of them attempt to leap over the cord surrounding them, which would have been easy, but they rather fled from the men towards the middle of the ring.

It occurred to me that it was worth while to observe attentively the system and art of driving the rein-deer, for the signs by which man makes himself understood by his domestic animals, form, when taken collectively, true languages, and consequently are objects of a sound comparative philology, which, in their elementary and general outlines, may offer analogies and points of comparison for those languages which men make use of among themselves. Many philologists, for instance, are of opinion, that the first elements of every language were of necessity natural signs, which, without any preliminary or arbitrary convention, immediately recalled to mind the object signified; language was so far, therefore, founded on Onomatopœa. This principle has been tacitly adopted in the comparative philology abovementioned, and shows itself nowhere more undisguisedly than in the theories respecting the training of the horse. It may be safely asserted, that there is no language made use of by men among themselves, which surpasses in perspicuity, brevity, rapidity of utterance, and nice distinction of degrees, that with which we make ourselves understood by a perfectly trained horse; and yet pains are taken to discover in the natural organization and feelings of the animal, a natural foundation for every sign so employed. In the attempt to trace back signs to their origin in nature, it is difficult to escape from vague, unfixed, and tortured meanings.

It is more reasonable to suppose, that the constant progress of equestrian art, and the increasing number of positions and movements requiring to be signified

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to the horse, occasioned the introduction of many merely conventional and arbitrarily assumed signs, which being handed down to us traditionally from the time of Pignatelli, and still further increased by his successors, exhibit the language used with the trained horse, as an assemblage of some natural with many purely arbitrary signs; just as the more cultivated languages are looked upon by philologists as collections of words founded on onomatopœa alone, with numerous signs which are merely conventional. When it is allowed that the management of the snaffle and the bit, with the combinations proceeding from the leg, the spurs before or behind the girth, the switch, the signal with the tongue, the pressure in the stirrup, &c., contain much that is wholly conventional; still it remains true, that the first germs of the language used to horses throughout Europe are natural signs, founded on onomatopœa. Till the Byzantine era, the ancients were acquainted only with the snaffle-bridle, with which when a pressure is made on the right side of a horse's mouth, the animal instinctively endeavours to get rid of the pressure, by yielding to it, and turning the head to the right; consequently the direction of the horse's course is also turned to the right. Xenophon had so little doubt as to the natural origin of the language of the bridle, that he adopted the converse of the proposition expressing it, and called the horses which have the peculiarity of being turned with difficulty towards one side, ἑτερόγναθοι (literally, other-jawed), which is confirmed by the Horatian comment;

equi freno currentis auris in ore est.

The acknowledged natural origin of the language used with horses may be taken by the inquirer as a proof of the principle that every language may take its rise from natural symbols, though in its

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subsequent development it be filled up and completed by signs more or less arbitrary. It was interesting, therefore, to have an opportunity of observing a language of signs, intended for another kind of animal, but appealing in like manner to the sense of feeling, and still in its original and most uncultivated state; it would appear so surprising if the means by which the Northern Asiatic communicates his wishes to his rein-deer, although far less cultivated even than the language of the Greeks with their horses, consisted of merely conventional and arbitrarily assumed signs, without any trace of onomatopœa.

When I first became actually acquainted, in Beresov, with the rein-deer in the sledge, my earliest inquiry was respecting the system and manner of driving. Bit and bridle there was none, and indeed a bit was as much out of the question in this case as in that of other ruminants; to which, owing to the structure of their teeth, the bit used for horses is wholly inapplicable, as is manifest with respect to European oxen, the saddle-oxen of the Yakúts, and camels collectively. Neither were they guided merely by words, as in the case of dogs, for there was a rein from the head of the animal to the driver's hand. It was clear, therefore, that the sense of feeling was made use of, so as by pulling and jerking, to notify to the animal the will of the driver. It now remained to be determined whether the signs made for this purpose were to be classed as natural or arbitrary; and in the solution of this problem, I had nearly missed the truth by surrendering myself unseasonably to an apparently competent authority. I thought that on this point I might rely on the intelligence and judgment of an inhabitant of Beresov, already mentioned, M. Bergúnof; and, as he had been conversant with and had used rein-deer conveyance from his earliest days, his assurance, that "the

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rein was tied to the animal's antler, and was thrown over and pulled from the right side or the left, according as the train was to be turned in the one or the other of these directions," seemed to be the more decisive, as a first and hasty view appeared to confirm it. Thus we seemed to have here arrived at a fact confirmatory of the natural meaning of the signs employed; but, in reality, we had found only an example of the force of prejudice founded on preconceived opinions. My friend, who gave me this information, had been from the beginning so convinced that a pull on the right side could alone make the animals turn in that direction, that he never doubted nor thought of ascertaining the truth by actual observation; in which latter case he would have perceived that his view of the matter was erroneous in every particular. The rein does not go to the antler; and the Ostyak directs his deer by means of signs and language purely conventional, and appealing to the animal's feeling only in a partial and equivocal manner.

I shall now endeavour to describe more particularly the yoking of rein-deer, as I saw it practised first by the Ostyaks here in the yurts of Kachegatsk, and afterwards witnessed it repeatedly during my subsequent intercourse with Ostyaks and Samoyedes. They first fasten a leathern girth round the body of the deer about to be yoked, immediately behind the fore legs. From the under part of this girth, below the breast, proceeds a single trace, which, as in the case of dogs harnessed in the sledge, passes between the hind legs. For journeys of greater length, every nart is provided with four, but ordinarily with two reindeer, which go abreast. In the case of four deer, the four traces go, without crossing, through a board with four holes pierced in it, in front of the sledge, and having passed through this, they are fastened by

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means of rings of leather or bone, to a cord which braces together in front the runners of the sledge—which latter arrangement equalises the draught, and modifies the effect of jerking and abrupt movements.

This being done, the reining began: a bone shaped like a half-moon, was placed like a head-board before the antlers of the deer which stood at the left, and was fastened by thongs at both ends, one of them being tied round the antlers, while the other passed under the animal's throat. To the left side of this head-board is attached, by a strong but flexible loop of leather, another bone of less size but similar form. This latter bone is movable, and rests just above the outer angle of the animal's left eye. A single rein then goes from the lower end of this bone to the driver's hand along the left side of the deer, passing—the better to keep it in its place—through a ring of bone, which is fastened to the girth. In driving the reindeer thus harnessed, a single and continued pull turns the animal to the left, whereas a quick jerking of the rein drives it to the right. Here, then, the predominance of conventional signs is manifest; for, although the mode of turning the animal to the left may be explained on natural grounds, yet the turning it to the right cannot be considered as the natural effect of jerking. This is still more manifest with respect to the other three deer. None of these is bridled nor connected with the deer which bears the rein, otherwise than by being fastened by the trace to the same sledge; yet they immediately follow the direction which it takes to the right or left. The spirit of imitation, and the habit of keeping together, are here chiefly operative, and the slight effort which the driver makes to direct the three unreined members of his team, are of little importance. Every Ostyak driver indeed bears in his right hand a slender pole, about twelve feet long, terminating in a knob of

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horn, which he uses to incite the animals to greater speed, by gentle blows behind, and also to guide in some measure the unreined deer, by striking them on the one or the other side with the end of the pole. The lower end of this, towards the hand, is thicker than the rest, pointed like a lance, and generally tipped with iron. It often serves, as we were told, in guarding the herds, to drive away the wolves which prowl about them.

About three o'clock in the morning we were again ready for travelling, and continuing till noon, we went over eighty versts, from the huts of Taginsk to another hamlet occupied also by owners of rein-deer, and called Kachegatsk. We went first through thick woods of well-grown trees, and in which the larch predominated, though the common and the Siberian pine (P. cembra) were also to be seen. The white birch was also conspicuous, mingled with the pine tribe. We then travelled continually on the ice of the western arm of the Obi, close to the thickly-wooded left bank. At times we halted on the river, to let the deer take breath after a hard run. On these occasions they immediately lay down before the sledge, tossed the snow with their snouts, and took it into their mouths to cool themselves.

The Ostyak men at the same time betook themselves eagerly to the enjoyment of snuff, which they always carry with them in the breastfold or pocket of the málitza, in a receptacle exactly like the European powder-horn. They shake the precious dust through the narrow opening of the horn, on the nail of the right thumb, and in so doing they conform precisely to the Chinese fashion. That their custom of taking snuff was derived from that quarter, is proved by the Mongolian word shàr, which here, as well as among the tribes of Eastern Siberia, signifies tobacco. Smoking is little in vogue among

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the Ostyaks hitherto seen; yet there were shown to us in Beresov some tobacco-pipes, very prettily carved, of mammoth-bone, which are said to be used by the inhabitants of the coast: the Mongolian name Khánsa given to this article, also points out the Chinese origin of the custom.

A substitute of home production, which the Ostyaks here sometimes mix with their snuff, was shown to us for the first time in the yurts of Kachegatsk, which we had now reached. This was a brown fungous excrescence, about the size of the hand, which they take from the stem of the birch, and, drying it for a long time near the fire, reduce it to powder. It was curious to observe here, as well as in the dwellings subsequently entered, how cleverly larch-wood was made in many cases to serve the ends of European cloths; for, instead of our napkins, towels, and handkerchiefs, and in cleaning the cooking vessels, the Ostyak women used very thin, long shavings of this wood, which being tied together at one end, formed a soft wisp. The women of the house generally carried a wisp of this kind fastened to their girdles, and when more of them were wanted to clean out the eating trough that we might be treated to some fish, they were made in an instant by the men

At these yurts I made the first magnetical observations since I left Beresov, and the twelfth from Tobolsk. We were now in latitude 65° 15′ N., that is to say about 6° 93′ north of our starting point, and at the same time about 3° 70′ further to the west. The inclination or dip had increased about 4° 20′, and now amounted to 75° 25′. The exceedingly small increase of the magnetic force confirmed the view already taken respecting the course of the isodynamic lines. Every step westward diminished the intensity, but, still further, a comparison of these observations with those which I made on a subsequent journey (from

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Tobolsk to Irkutsk) has proved to me, that between Kachegatsk and the parallel of 56°, the isodynamic lines take collectively the direction of South 36° East, and that an equal increase of intensity will be found in advancing from Tobolsk 346 geographical miles to the north, or 220 to the east.

The thick and tall woods which surrounded us on our journey to-day were far from corresponding with the picture which the European geographer, too much bent on generalisation, usually sketches of northern Siberia. We were now but a moderate day's journey, eighty-four miles, distant from the polar circle, and yet larch, pine, and birch still grew abundantly, and, indeed, they were nowise inferior in appearance to the trees of the same kind in the vicinity of Tobolsk. We also found another proof of the vegetative power of this tract, for about twenty versts E. N. E. from Kachegatsk stands one of those provision-houses already mentioned, which is kept by Russians settled there, and is often visited by traders from Beresov. The fertility of the banks at this picturesque spot is quite famous, for not only are they adorned with the forest trees which cover the low plains on the western side of the river, and here retain their full vigour, but garden vegetables have also been reared, such as turnips (Brassica rapa) of immense size. Blackberries also, and roses (probably R. calycifl. Gmelin), grow luxuriantly in the wood.

About three o'clock in the afternoon we again started on our way northwards on the ice. The weather was mild with a gentle south wind, the temperature of the air not falling below —15° R. Snow fell abundantly, in very small flakes, slowly and almost perpendicularly, and helped to cover up warmly the traveller as he lay stretched in the open nart. The rein-deer travelled to-day at an easy trot, for it was eleven o'clock before we reached a dwelling,

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which was reckoned to be fifty versts from Kachegatsk. It is true, indeed, that by the way we had turned aside from the left bank into the wood, but the delay thus occasioned hardly exceeded an hour. In this yurt we met with a Kosak of Beresov, who was charged with the troublesome commission of taking to Obdorsk three horses and the requisite supply of winter fodder. The Russians of that place wanted the horses for visits in the neighbourhood during the fair, and the collecting of the yasàk.

The rein-deer station at which we had now arrived presented quite a new appearance. I looked in vain for wooden cabins: there were here only two conical tents, wherein our new hosts had just established themselves in the middle of the forest. Portable nomadic dwellings of this kind are here called Chúmui (singular Chúm). Long poles, in an inclined position, were fastened together at the upper end, while their lower ends, about a foot asunder, stood on the ground so as to form a ring. This frame-work was covered with rein-deer skins, an opening being left only at the point of the cone, and at one place the poles stood more widely apart, so as to allow one, lifting the corner of the skin, to creep into the tent.

In the middle of the tent was a blazing fire. All the men were sitting on skins with the upper part of their bodies bare, and their backs against the hair of the tent-covering. A little boy of four years old had nothing on but drawers, and a little child lay in a canoe-shaped cradle made of rein-deer skin. Two women of middle age were also sitting on the ground, with all their usual clothing, and they were wrapped up even below the shoulders with the veiling head-dress, which was here made of Russian woollen stuff. With great coyness they refused to show us their faces, and when I pulled up playfully the veil of one, she replaced it at once and cried

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out lustily; yet the men who were present and witnessed what was going on took so little notice of it, and seemed so indifferent, that it can hardly be supposed that jealousy of strangers has here given rise to the fashion of veiling. They nodded assent, showing that they understood me, when I applied to these veiled women the name ánkí, which I had been previously taught to call them. At first the women concealed their hands too under their clothing, and some persuasion was necessary to induce them to put them forth so far as to let me see on their fingers, not only the metal rings which they wore for ornament, but also a tattooing which I remarked here for the first time and quite unexpectedly. Several parallel lines of blue points were marked across the joints of each finger. On some of the men also I observed blue spots or stains on different parts of the body; but they were not so close nor so artificial, and probably were intended rather as marks or memorials than as ornaments. In general, the custom of tattooing, or of marking the skin by acupuncturation, is, in Northern Asia, extremely rare; for, with the exception of the family here mentioned, I found it existing only among the Tungusian inhabitants of the icy sea (1829, January 28.), and there, as well as here, only in an imperfect and unrefined state. But the usage, which now prevails but little in the north, was formerly widely diffused over the Old World, even under low latitudes. To say nothing of the Siberians, or of the Picts in Britain, or of the Geloni on the Don*, or of those neighbours of the Jews who gave occasion to the prohibition of tattooing contained in the Mosaic laws†, we find that in the time of Xenophon (400 years before Christ), the same custom existed among

* Tacitus, Agric. xi. 3.; Ammian. xxvii. 8.; Virgil, Georg. ii. 115.
† Deuteronomy, xiv. 1.

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the Mosynoeci, a perfectly white people under the parallel of 40° N , and in 37° 30′ E.*

By means of three cross sticks, tied in a horizontal direction to the tent-poles, the pot was hung over the fire to melt some snow that we might dress our fish, and it was singular to see the women still veiled during this operation, for they scarcely ever raised up the head-cloth, or opened it a little on the side towards their work. Here both men and women were large and well formed, with pleasing countenances and perfectly healthy appearance. Eruption on the head and inflammation of the eyes had been seen less and less frequently since we left Beresov, that is to say, since we had advanced further into the country possessed by owners of rein-deer; and here, where purely nomadic habits prevailed, there were not even the slightest traces of disease. It is not unlikely, then, that the Verkhóvian Ostyaks are the chief sufferers from the miasmata introduced unconsciously by the Russians. It was only among those of the natives who, by partially adopting Russian customs, spoiled the completeness of their domestic economy in respect to food and clothing, that the seeds of disease seemed to have fallen on a susceptible soil.

The chase of fur animals is during the winter the chief employment of the rein-deer Ostyaks taken collectively. They are engaged in it daily, and hence we observed that the men in the tents here, like some of our drivers, constantly wore an apparatus which is indispensable for their archery. This is a strong and bent plate of horn, worn under the usual clothing, and covering the inside of the lower arm, from the wrist up, for about two inches, being tied on with thongs. Without such a protection it would be impossible to endure the blow which the string gives the

* Xenoph. Anab. v. 4. 32.

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wrist. This productive chase, with the free wandering over an extensive tract, which seems absolutely necessary for those who would keep large herds of rein-deer, had made our host of to-day an opulent man. In this place they kill foxes and squirrels; but in summer they go westwards, towards the mountains, which are rarely visited by Christians. There they feed their herds, and live upon them, at the same time collecting for trade as many skins and as much venison as possible beyond their own wants. They mix with Samoyedes and Voguls on the common pastures, but in winter they visit their friends settled on the Obi, in order to procure a stock of dried fish. Whatever Russian goods they want, they obtain partly by means of the Samoyedes and Voguls from the government of Archangel, partly they procure them themselves at Obdorsk, where the quantity of skins and furs which they collect during their long absence secure for them a preference in trade above the Ostyaks settled in the place. A copper basin, which I saw among the utensils belonging to these dwellers in tents, must have been very dearly purchased from the Russian traders; yet, in return for the entertainment given us, they were very glad to receive a few slices of bread. This station was named Keegat, but I know not whether the name belonged to the place, or to its occupiers, for on my return from Obdorsk, the tents of Keegat had totally disappeared.

December 6.—We waited in the tent till one o'clock in the morning for the rein-deer. They had wandered far from the dwelling, and even after they had been driven in, they seemed hungry, and tried to escape again to the pasture. For catching them separately, it was not enough to go round them with the cord, but this being rolled up, and the ends held fast, was thrown upon the animal, so as to entangle

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it. From the tents of Keegat, we proceeded twenty-five versts, partly on the little Obi, partly on the left bank, and about five o'clock in the morning we arrived at a group of wooden cabins, which they called Múshí. Here, we were told, no one had been yet travelling this winter; the rein-deer, therefore, had not been seen for a long time, and no one knew where they were. The cleverness which the Ostyaks evince in cases of this kind cannot be sufficiently admired. It was ten o'clock, however, before the shouting drivers were heard from a distance, on their return with the herds; but it is so much the more surprising, that going forth in the darkness of night they should still feel sure of finding them. The Ostyaks of Múshí, as well as those occupying some of the wooden yurts subsequently met with, constantly kept a portion of their herds near them, even in summer, in the neighbourhood of the river. There is no want here of food for the rein-deer; yet it suits these animals better to let them run free in the mountains during the warm season, because they can there more easily escape the persecution of the flies, by rolling in the snow which remains in the glens and sheltered places. We were treated to some undressed frozen fish, which at this time of the year constitutes the ordinary nourishment of the Ostyaks settled here; it is usually cut into long thin pieces for eating.

The day lasted three hours at Múshí: the sun at noon attained an elevation of 1° 40′ above the horizon, but was never visible, as the sky was clouded. We travelled from eleven in the forenoon till nine at night, on the ice of the little Obi, as far as the winter yurts of Shurushkar. About half-way we saw some fishing-baskets suspended from the ice, and found some Ostyak men, who were busy with them. They had travelled to this place with rein-deer, and two

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narts with deer were standing on the ice, already laden with fish. Triangular openings were here cut in the ice, parallel to one another, and of considerable size, and from fifteen to twenty feet asunder, to allow the *gimgi*, or fish baskets, (in Russian, Mordui), which are of a conical form, about ten feet long and five or six feet wide, to pass in the horizontal position of their longer axis. The wide entrances into these baskets, and consequently the wide end of the openings in the ice, were turned down the stream, so that it is manifest that they here reckon on the movement of the fish up the river, even in winter. They further assured us, that there was a weir constructed of stakes, across the whole river, with openings in it only just below the spots where the baskets were suspended; at present this work was completely concealed by the ice. The Ostyaks had already taken up and emptied two of those great baskets, and a long nart was quite filled with the sturgeons and salmons thus obtained.

In the evening we were received at Shurushkar with the assurance which had met us at Múshí, that the rein-deer had gone far off and could not be driven in till the next day. We were obliged therefore to remain for the night in these wooden yurts, which, in their construction, exactly resemble those of the Verkhovian Ostyaks already described; only that, besides the usual window at the side, there is here always a second in the flat roof of the hut; this opening also being closed by a transparent piece of ice. The rein-deer skins in the berths made a very comfortable bed, and there was nothing to incommode us but the pungent smoke from the fire in the chubal, which filled the whole hut, and produced coughing. In truth we had grown accustomed to this annoyance in all the yurts which we had already visited, but here it was worse than usual,

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partly because the wind was unfavourable to the draught of the chimney, and partly because larch-wood, which is remarkable for the pungency of its smoke, was alone used here for fuel. Towards midnight the fire was allowed to go out, and a clay lamp fed with fish-oil then gave us light. Here as well as at Múshí I observed that the men wore a peculiar piece of finery; for they had a string drawn through the left ear, to which were tied a great variety of tinkling ornaments.

December 7.—It was not till eight o'clock in the morning that the rein-deer were brought in and yoked to our sledge. About forty minutes past seven I made a magnetical observation, but in so doing I was obliged to use a lantern, for even in a place quite open to the heavens, the twilight was too feeble to allow of reading the divisions on the scale. The Yurts of Shurushkar stand on the naked slope of the steep loamy banks which from this place to Obdorsk, with little interruption, run along the left side of the here undivided river. These hills announce in truth the approach to the mountains in the west, and they occasion, before the next stage is reached, a bending of the Obi to the north-east. The elevated left bank continued still covered with wood, but the trees did not stand so thick as we had observed them a few days before, just on this side of Beresov.

During the night snow in small flakes had fallen continually, but as we left the Yurts of Shurushkar the sky cleared completely, while the thermometer stood at—22° R. The air seemed quite at rest, and it was only as we first set off towards the north that I perceived, in the open nart, a remarkable difference of sensation, according as I turned my face towards the right or the left; for in the former position it cooled much faster; this can be explained only by supposing a light movement of the air from the east.

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It was now necessary to rub the nose and other uncovered parts of the face, from time to time, with the hairy surface of the glove, to prevent their being frozen; the other parts of the body were so perfectly protected by the Ostyak fur clothing, that even in today's temperature one could lie motionless in the open air for several hours without inconvenience.

After an hour we proceeded along the wide plain which skirts the river, here running north-eastwards, on the right, but we never went far from the Obi. About the middle of the stage, as we were on a spot quite free from wood, the sun rose completely above the horizon, while, on each side of it, and at the same elevation with it, there appeared a brilliantly luminous and prismatically-coloured secondary image. These luminous images were abruptly terminated both above and below, against the blue sky, but in following with the eye their direction downwards, one could discern, at the points where the lines of continuation met the horizon, the limbs of a hyperbolic arch, which united at a point on the ground not far from the runners of the sledge, and always in the vertical plane passing through the eye and the sun. Such was the form of this bright arch, that lines drawn through it from the spectator's eye to the heavens below the horizon would there form a circle, having the sun in the centre, and the secondary images in the circumference; or, in other words, the visible arch on the snowy plain was a perspective projection of the continuation of the parheliac circle below the horizon. Like the secondary images at the sun's height, the hyperbolic bands on the ground also were brilliantly coloured; in both cases the red on the interior edge was particularly conspicuous. But the brightness and the colour had not their greatest intensity at the part of the arch which was nearest to the observer. Indeed at the vertex of the

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arch on the ground, the colour was extremely feeble, and often interrupted, evidently because the light reflected from the snow grew more intense towards the spectator. When I looked directly towards the sun, I could perceive around it very fine and sparkling needles of ice moving in the air. These crystals were unquestionably very minute, and were rendered visible only by the strong light, for nothing of the sort was to be seen at the same time falling on the sledge, or where there was a dark background. I did not measure the angular distance between the sun and the secondary images, but the whole phenomenon was so like that of the Stolbui, or columnar images seen in Tobolsk, (December 20), that it is probable that the distance was alike in both cases, or from twenty to twenty-two degrees; and this seems to be confirmed by the constant distance of the vertex of the arch; for while my eye was about three feet above the ground, the vertex, or lowest point of the arch, seemed to be always about six or eight feet distant from the right-hand runner of the sledge.

The inhabited place which we reached about one o'clock in the day is called by the Russians the Town of Vandiask, because at the time when they first penetrated so far, as well as at present, an Ostyak chief was settled there. Three strong wooden yurts lie on the bare hill on the right bank of the great river, which is no longer divided. In construction and arrangement these habitations did not differ in the least from those of the other Ostyak people. They seemed, indeed, to be rich in dogs; in other respects they had the appearance of poverty. The owners, however, made known their high rank and birth by their love of brandy, and by their behaviour, which, though aiming at certain objects in view, was yet good-natured. As usual, also, the people here seemed to be all members of the same family. I

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never found among the Ostyaks any trace of hired service, or of any connection between labour and station. I had advanced far ahead in the open nart, and was therefore taken by my new host for a merchant, or some other kind of adventurer who had gone astray. One of them announced himself, in very bad Russian, as a Starshina or elder, and at the same time, with a strange mixture of shyness and eager earnestness, he required me to show him a Russian passport, or to let him examine my stock of tobacco and brandy. My assurance that I had neither, threw a gloom over every countenance, without, however, checking the course of their habitual hospitality. Afterwards, when the remaining and larger portion of my train arrived, they tried new methods of attack. Bowing courteously, they laid at my feet a heap of frozen fish, and then kept repeating, "Noble sir, we present you with this." After I had repaid this compliment with a little brandy the matter grew still worse, for they now added a dozen great salmon to the presents on the floor, and at last one of them brought out a sturgeon six feet long. They cut it up to show the roe, from which indeed we got two quarts of caviar. The ova were very large and fully developed, but separated throughout by layers of fat about a line in thickness.

While I was making some magnetical observations, the men here seemed to take an unusual interest in the instruments, yet they seemed to be agreed among themselves that the whole was but a pastime, and they often exclaimed that it was "pretty." On taking leave, one of them made use of a Russian expression which he had learned, meaning "ill speed to you;" but it was evident that he intended to remind me of my promise to return soon.

We now turned aside from the river, almost due east, and till nine at night travelled over a hilly

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country a distance of fifty versts. During the night I had recourse to the covered nart, but found that, though preferable in a snow-storm, it is not so agreeable, when the air is calm and at the temperature of −25° R., as staying in the open air; for the moisture from the breath congealing formed a frosty mist much more distressing to the sensations than dry cold in the open air. And on the felt lining of the nart was deposited a thick rime, which being shaken off from time to time fell in flakes like snow. Another kind of annoyance increased to-day my distaste for this kind of vehicle, for on the uneven ground one of the runners sank deep in the drifted snow, and as I moved in the interior, the vehicle fell over completely on one side. It was fortunate that the door was uppermost, so that my escape was easy. Our two other sledges had gone a long way in advance, and I laboured hard for a long time, to no purpose, endeavouring to raise the deep-sunk carriage. At last we succeeded with the help of another Ostyak, who happened to come that way in a dog sledge. While he was still a great way off our attention was called to him by the cry which the dogs always raise as soon as they get the scent of a reindeer sledge.

About nine at night we reached the yurts at which the rein-deer are changed, for the last time, before arriving at Obdorsk. The dwelling here was large, and well-built; the owner, too, called himself an Ostyak captain, and perhaps it was owing to his rank, that he alone, of all his fellow-countrymen, wore long and well-trimmed moustaches. He also brought me fish as a present, in the same manner as was done at Vandiask, but not with such selfish views. The annoyance of the pungent smoke was far more insupportable here than we had ever experienced it, and when some wood was put on the fire,

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to melt snow-water, even the oldest Ostyaks began to cough. But the throat seems to grow used, after a little time, to this irritation, and we all slept quietly till midnight, when the rein-deer were brought in.

December 8. — After a monotonous journey of eight hours, during the night, we reached the hills of Obdorsk about nine in the morning, while the dawn was still extremely faint. I was not a little surprised at the smell of fresh bread, which, in the calm cold air, had diffused itself throughout the place, and served, as we approached these dwellings of the remotest north, to announce their true significance.

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CHAP. II.

APPEARANCE OF OBDORSK. — OBJECTS OF THIS VISIT. — IVANOF'S SURVEY OF THE NORTHERN COASTS. — VAIGATZ ISLAND. — OBDORSK FAIR. — BREAD-MAKING. — PELTRY. — QUILLS AND DOWN. — NATIVES FREQUENTING THE FAIR. — THE SAMOYEDES. — POLAR BEARS. — THE DOGS. — CONNECTION BETWEEN THE OSTYAK AND HUNGARIAN LANGUAGES. — MISTAKES OF EUROPEAN ETHNOGRAPHERS. — OSTYAK SONGS. — MUSICAL INSTRUMENTS. — THE SWAN'S VOICE. — RELIGIOUS RITES DESCRIBED. — THEIR RESEMBLANCE TO THOSE PRACTISED ON THE NORTH-WEST COAST OF AMERICA. — RELIGIOUS DOGMAS OF THE OSTYAKS. — THEIR CHIEF DEITIES.

We took up our abode in a Russian house, kept, on account of M. Nijegorodzov, by two young traders; and there we found our new hosts employed at a great oven, baking, while the loaves of rye bread already baked were piled in hundreds from the floor to the ceiling. The fish skin, which formed our window, dimmed the daylight to some extent, so that candles were necessary till near noon; but out of the house, the snowy landscape, under a clear blue sky, presented a charming view. The wooden church, the dark log-houses of the Kosaks, and the somewhat lower yurts of the Ostyaks, lie picturesquely scattered over the hills, which, separated by narrow glens, form the right bank of the river Polui, which runs westwards. Dark columns of smoke rose in straight lines from all the chimneys.

Here, it was not the action of water which gave these hills their remarkable outlines, but the frost, which causing cracks in the earth, of great depth, frequently separates masses which resemble basaltic columns of colossal size. The water which runs

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down to the river, along these cracks, on the melting of the snow, wears away only the outer edges, for at a little depth the ground here remains perpetually frozen. Further west was seen the broad ice of the Obi, bounded there also by steep earthy banks, while in the background, from N. to N. W., stood the mountains so long looked for, in all their grandeur. The sun shed its rays from just above the horizon; a dazzling light was reflected from snowy plains towards the south, while long shadows extended northwards over the white landscape. But the long chain of mountains, from the foot to the summit, was dark blue, and snow could be discerned on it only in glittering, detached, and oblique lines. Below, on the ice of the river, moved slowly a long caravan of Ostyaks, who were changing their habitation. The long rein-deer narts could be distinguished in different parts of the train, while between them and behind went the free animals of the herd, treading each in the tracks of those preceding. As there is no more impressive sight to those who have been a long time at sea, than that afforded by the motions of a ship sailing by, so to me the solemn procession of the rein-deer sledges, seen from a distance, had quite a novel appearance; for while among them one never thinks of their singularity or agreeableness as objects of view.

There were three important purposes to be here accomplished, viz. the geographical and magnetical determination of the place; the sinking of a thermometer to ascertain the temperature of the ground, and the equipment of an expedition to the neighbouring mountains. Not that the near view of these mountains was particularly desirable on account of their forming the arbitrary limits between Europe and Asia; but because it still remained to be proved that in geognostic characters they actually represent

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a portion of the Uralian chain, and that these mountains extend like a *poyas* or girdle, according to their old Russian appellation, from the fifty-first degree of latitude to the polar circle and icy sea.

The astronomical labours were already begun to-day, and the sky remaining quite clear they had the full advantage of the early commencement of night; at the same time the two other objects in view were forwarded not a little by the hearty co-operation of the chief authority and the cleverness of the Obdorsk Kosaks. One of them set off to-day already on the road to the mountains, in order to announce our intentions to the Ostyaks or Samoyedes wandering in that direction. The auger for boring the ground was also got ready and set to work; although this unusual operation was pronounced to be extremely difficult, as even in summer the graves here, which are never more than seven feet deep, are ordinarily excavated with the aid of fire.

I had seen with surprise the Russian naval flag flying on the roof of one of the houses on the river-side, and was now informed that this was the dwelling of seamen who wintered in the place. It was, in fact, the pilot Ivanof, who, along with a young assistant, had been working for seven years at a detailed survey of the coast from the Petchora to the mouth of the Obi, and for the last two years had fixed his head-quarters in Obdorsk. During the winter he had completed most of his journeys along the coast, and this he had done by means of the rein-deer sledges which are used the whole year round by the Ostyaks and Samoyedes on the tundras, as they are called, or mossy plains. As soon as the bays along the shore and the mouths of the rivers are frozen over, the Ostyak and Samoyed inhabitants of the West quit their tents on the sea-side, and withdraw with their rein-deer to the mossy tundras of the

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interior. On the island of Vaigatz indeed, which is known to the Samoyedes only by the name of Kháyodeyà, and is celebrated as their chief place of sacrifice, many owners of rein-deer remain the whole year round; other natives, and Russians also, go over to it in summer both to fish and hunt. M. Ivanof had reached that island in one of his earlier excursions, which he made from the Petchora along the coast in the karbasi or kind of boat used by the Arctic Promuishleniks in their maritime expeditions; he had reached it also from this place with the Samoyedes, who settle in summer along the shore, on the points nearest to Vaigatz, and thence cross over. The southern and south-eastern coasts of the island present deep rocky cliffs, not exceeding, however, 200 feet in height. Some fragments of clay-slate from these cliffs, in which were disseminated cubic crystals of pyrites, were given to me. These stratified rocks are said to be particularly liable to be broken asunder by frost, and to other wear from the action of atmosphere and water; and it is stated that the pieces which fall into the sea are soon worn by the waves into balls of about an inch in diameter, and which are here known by the name of nut-stones (oréshniki). The mouths of all the rivers flowing from the island are rendered shallow, more or less, by banks of these stones; nay, it often happens, when the wind blows on the shore, that the surf accumulates in a few hours across the river a bar rising some feet above the surface of the water. The river is then changed for a time into a lake, and the Promuishleniks who may happen to have entered it, are obliged to drag out their karbasi over the mound of stones. The tides take place regularly, and with five or six hours' ebb, on these coasts of the icy sea, yet they do not rise above two feet, and it is only when the flood is aided by a gale, that it is perceptible as far up as Obdorsk.

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In surveying the coasts, M. Ivanof relied for his measurement of angles on the compass, and for that of distance, on the speed of the rein-deer sledge, as ascertained by repeated experiment; he reckons 7·9 versts, or 4·52 geographical miles, as the average hour's rate of the yoked deer.

A still more extensive knowledge of the country is obtained by the Russians permanently settled here, by means of the great trade which is concentred in their annual fair; for this brings them continually into immediate contact with all the nomade tribes who wander over a region extending through fifty-one degrees of longitude, or, in this latitude, of 1250 geographical miles, from Archangel, by Obdorsk as far as Turukhansk on the lower Yenisei. Enticed by the Russian wares, these travel-loving men begin to draw near about the end of December, but it is not till February that the barter is carried on in the liveliest manner, while at the same time the Yasak or tribute of furs is collected from such of the assembled strangers as belong to the circle of Beresov. Already were the labours of our hosts exclusively directed to preparations for this trade, as 2000 poods of bread to barter with were to be got ready on M. Nijegoródzov's account before the opening of the fair; the Kósaks, too, were all busy baking each on his own account. Besides the bread I saw also in the house where I was dwelling, a chest full of coarsely wrought brass and iron trinkets for the nomadic dealers; rings for the women, little bells and other metallic ornaments which the Samoyed women fasten in their hair, but particularly the brass studs already mentioned as adorning the Ostyak girdles. And here I learned for the first time the reason of the uniform quality of these last-named ornaments, for it is from the stores of Obdorsk alone that they spread over the whole north; but it is now customary here, and has been so

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perhaps for centuries, to stamp on these studs the figure of a dog or else of a flower like the rose. Finally our hosts pointed out to us, as articles most eagerly sought after, an enormous quantity of old and rusty cavalry sabres, which are used by the Ostyaks at their principal religious ceremonies; for similar purposes were provided armlets and coronets of brass, with which the Ostyaks are now content to deck their idols, instead of with gold and silver as formerly. Tobacco, iron and copper pots, axes, knives, needles, steels for striking fire, and various other indispensable articles, are brought here by the Russian merchants and adventurers, who, from Tobolsk and the settlements along the Obi, assemble at this great fair.

The articles purchased here by the Russians are, besides peltry, such as we had seen in Beresov, ready-made clothing of rein-deer skin in large quantities, venison, and deer for slaughter, besides fossil ivory or tusks of the mammoth for exportation: these tusks are most usually found here in pieces weighing from four to six poods (160 to 240 lbs.). It is calculated that, exclusive of the furs paid to the government as tribute, peltry is purchased annually by the Russians in Obdorsk, to the amount, according to the low prices obtained there, of 150,000 roobles. Finally, down also (pukh), and whole skins of various kinds of geese, are brought to the merchants of this place. The Ostyaks and Samoyedes dispose annually of spoils of this kind to the extent of 600 poods, and as it is found that in the unclean state in which these skins are brought to market, it takes eighty of them to make a pood, it follows that Obdorsk is annually supplied with the feathers of 48,000 geese.

Among the native tribes who resort to the fair of Obdorsk to barter for Russian goods, are the inhabitants of the mossy plains or tundras to the

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eastward, between the Obi and the Yenisei, and who, though distinguished from the Nisovian and Verkhovian Ostyaks, are yet of Ostyak race. Then there are the Samoyedes, partly from the government of Archangel, beyond the mountains, partly from the neighbourhood of Obdorsk, which latter are distinguished into Kámenie and Nisovie, or mountaineers and lowlanders, according as they spend the summer in the hills, or remain near the river or sea-coast for the sake of fishing. Those who choose the latter occupation give the greater portion of their herds to the other party to take with them to the pastures on the hills; and they are poorer than the mountaineers, because, as they say here, the latter take better care of their own herds than of those entrusted to them by their friends. There is no essential difference between the Siryáni or Samoyedes, inhabiting the upper Petchora, and others of the same race.

All these various nations and tribes can make themselves understood to one another, and also to the traders of this place, who make use of the Ostyak exclusively, as the commercial language; only a few Kosaks understand the Samoyed language also. Yet it is by no means unimportant to be able to distinguish the natives frequenting the fair according to the geographical situation of their abodes, as a very marked difference in the quality of their merchandize is connected therewith. Thus, of all the wolves, none are prized so much as those killed east of this place by the Ostyaks of the Yenisei, because their very long and soft hair gives them a great superiority over what are called the forest and steppe wolves of middle Siberia. The beauty of these beasts of prey seems to increase in the same proportion as the number of wild rein-deer frequenting the tundras, for these shy tenants of the wilds are particularly

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numerous between the Obi and the Yenisei, and the Ostyaks of that region are famed for their dexterity in killing or in catching them. Tying leathern cords between the tops of the antlers of their tame deer, they turn the animals loose, one by one, in the neighbourhood of a herd of wild deer; these do not fail to attack the strangers, and their antlers becoming entangled in the cords during the contest, they are held fast by the tame deer till the men arrive. These Ostyaks know also how to plant spring bows which send the arrow against the animal's breast.

The Samoyedes, on the other hand, are praised by all their neighbours around for the great variety of produce which they bring back from their hunting excursions. They take the fur animals, not only by the ordinary artifices of traps and weapons adapted to every circumstance, but also by putting themselves as much as possible on an equality with the animals pursued, going on all fours and imitating the brutes in voice and clothing. They contribute by far the largest portion of the skins of the Polar bear brought to the fair of Obdorsk; and in consequence of their more intimate acquaintance with these animals, they do not regard them with the same dread as Europeans. The Samoyedes assert that the white bear far exceeds the black bear in strength and ferocity, while fully equal to it in cunning, yet owing to his unwieldliness they encounter it without fear, and always reckon on victory as certain. A man will often go singly against a Polar bear, eight feet long, without any other weapon than his knife, which he fastens to the end of a pole. In spring and autumn these animals are found on the ice, near the holes from which the seals come forth to breathe. There the bear covers himself up with snow, facing the hole, and with one paw stretched into the water. The Samoyedes, at the same time, practise like artifice, for

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they, as well as the bears, conceal themselves near these openings; but they let the seals come out upon the ice, and then cut off their retreat by shoving a board over the hole. About midsummer, when the ice on the coast is broken up, white bears pass over in great numbers to the main land, where they find nothing to subsist on but a few mice. Some remaining on the floating ice islands, perhaps, can still procure seals. But beyond the Polar circle, they all collectively keep a strict fast for a season, for they lie motionless, rolled up in the snow near the sea shore, from the disappearance till the return of the sun. The black bears, in Kamchatka, experience similar vicissitudes, for they too pass, in the course of the year, from the indulgence of great voracity to the scantiest fare, and then fast completely during the winter.

About eight o'clock in the evening, the dogs, of which about four hundred are kept here by sixty inhabitants, commenced a loud and mingled howling. It is hunger which daily calls forth, at the same hour, these passionate outbreaks, and then the dogs are sure to chime in together, as soon as one has begun the howl; otherwise they are quite silent, and never bark nor cry, unless at starting on their course when yoked in the sledge, or on coming across a reindeer sledge in their journey. Even during the severest cold, the dogs require no protection from the weather. They sleep outside round the houses to which they respectively belong, in holes which they have thawed in the snow by their own warmth. The Ostyaks look upon it as a sign of bad weather when the dogs lie very quiet in their icy grottoes; and, indeed, the truth of this prognostication seemed to be confirmed to-day. Here, as every where else along the Obi, they are fed with nothing but fish, which, for this purpose as well as for human food, is first dried in the sun, and then

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being pounded, bones and all, it is stored up under the name of *porsa*. On journeys this food is carried in bags made of sturgeon's skin.

It is easy to understand why the dogs kept in Obdorsk should be much more numerous than those in Beresov; for in the latter place it is still possible, and usual, to keep horses, but in Obdorsk reindeer take the place of horses, and their increase is incompatible with a settled town life; for although reindeer are to be found at some fixed habitations higher up the river than Obdorsk, where they find suitable and sufficient pasture in the neighbourhood of the yurts, yet in these instances the herds are small, as their owners are few in number. Moreover, every yurt has its dogs, as well as its reindeer, and this is the case, without exception, wherever fishing forms a regular occupation of the people. A fishery, indeed, is an indispensable condition for the keeping of dogs; and hence it is, that the tent Samoyedes, whose chief business is the chace, and who obtain their store of fish only by bartering with their neighbours, keep only reindeer. As to the dogs here, it is estimated that they can draw five poods (200 pounds) each, in the loaded nart; but the Ostyak mode of yoking them hardly admits of the employment of more than two at a time, and in this respect it differs essentially from the Tungusian and Kamchadale plan, of a long trace in the middle, with lateral continuations. Madness among the dogs would be, in this country, a most formidable scourge, and would infallibly cause the destruction of whole races of men; but every one here assured us that the disease is wholly unknown to them. Steller has stated the same thing respecting the dogs of Kamchatka; so that hydrophobia would seem to be one of the European results of living in towns. One essential and unfailing distinction between the dogs of Siberia and those of

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Europe, lies in the very moderate food of the former; whence it might be inferred that it is excess, and not want, which generates the morbid habit.

December 9. — During the whole day we had a heavy fall of snow, with violent gusts of wind from the west, yet this weather did not hinder the hardy Kosaks from working in the open air, and from boring the auger hole. They first made a pit in the ground about five feet deep, with axes, and to-day they bored from the bottom of the pit, about seven feet, without reaching unfrozen soil, as was the case at Beresov. The men here all wore a capital *gús*, or third coat, with very long hair; and as they ran round, turning the auger, they reminded me forcibly of a dance of bears.

The weather to-day did not allow of other occupations out of doors. The falling snow cut off the prospect in all directions, and we were happy in being able to find some compensation in our hosts' conversation, and particularly in availing ourselves of their complete knowledge of their Ostyak language, to make a vocabulary of it. Unfortunately, I was not aware, till long after I had bidden farewell to the Ostyaks, how important was the study of their language, both as to its material and its grammatical structure, for the purpose of deciding the question, so long contested by ethnographers, respecting the origin of the Hungarians, and that this remarkable people could be traced historically to their original settlements on the Irtuish. All that could be then done to supply this omission, was to compare a great number of words having the same signification, in the languages of the two nations in question; and the result of this comparison has been the discovery of an indisputable affinity in the case of more than a third of the Ostyak forms.

I should certainly have done more towards con-

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firming or illustrating the connection between the Majar and Ostyak languages, had I studied the latter from the first more with a view to such a comparison: yet the discovery of a close resemblance in eighty-one of the most essential roots, as the result of a supplementary examination of two hundred and thirty-four pairs of words, cannot be thought accidental and inconclusive, any more than the striking agreement in the characteristic terminations of verbs and noun substantives. Besides, there will be no difficulty in finding, in the language of Obdorsk, numerous words having the same form as Hungarian words, yet not with the same signification, but with one akin to it. This is a phenomenon resulting from the separations consequent on nomadic life, and which is observable, as a little acquaintance with the other languages of Asia will show, in the dialects of the most closely connected tribes: thus, for example, the Ostyak word *aen*, ten, has been rejected, in its absolute sense, by the Hungarian language, the Slavonian *tis* (Russian *des*) being adopted in its stead, while yet it reappears in the compound Hungarian words, *oetv-en*, *hatv-an*, *hetv-en*, fifty, sixty, seventy, and can alone explain them. Many other examples may be found of words possessed by both languages in common, though not used in both with equal latitude of sense, or with the same proper application.

The question respecting the origin of the Hungarians has been long entertained by the ethnologists and philologists of Europe, with so marked a preference, that any attempt to give new interest to it might be compared to a drop of water added to the ocean; and yet it is certain, that if Europeans could be persuaded to lay aside certain preconceived opinions, the unbiassed observation of the ordinary phenomena presented by the nations of Northern Asia would be rendered, in many respects, much

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more easy. As it is proved distinctly, by historical documents, that the Asiatic invaders, who annexed themselves, at the beginning of the ninth century, to the population of Hungary, issued originally from both banks of the northern Irtuish; and also that the hordes of Huns, who, at an earlier date, (from 377 under Attila) coming from Asia, spread themselves over Dacia and Pannonia; and who, from the fourth to the eighth centuries, like oscillating waves, alternately retreated eastwards, and returned again as invaders, were all closely connected in race with the Hungarians, or Hunno-yugrians, who still remained on the Irtuish; it might be expected that a deeply seated resemblance would be found, at the present day, between the language of the Majars and that of the Ostyaks. Lehrberg has completely proved that the name Yugri, or Yugria, in old Russian writings, refers to the Ostyak country, and still bears that sense when used among the imperial titles*; and indeed, it seems probable that the etymology of this name is to be found in pure Ostyak, in which language *yukh* means a wood, and consequently Yukhria would signify the great and justly celebrated forests of the middle Irtuish and of the Obi.

We cannot, therefore, help feeling surprise and regret that the learned Hungarians of modern times, who have left Europe professedly for the purpose of seeking among the various races of Asia that which is most nearly akin to their own nation, should have totally rejected the strong testimonies in favour of Siberia and the north, and, with self-willed obstinacy, should have turned in preference to Thibet! But it cannot be said that this extraordinary decision was the result of any researches into languages, for though Beregszaszi pointed out many instances of agreement between the Majar language and the

* On Yugria, in the Acta Acad. Petropol.

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Hebrew, Chaldee, Syriac, Ethiopian, Arabian, Persian, Kurd, Zend, Pehlvi-Sanscrit, Zingarian or Gypsy, Hindostannee, Hindee, Manchurian, Tatar, Armenian, Greek, Kalmuk, and many more, yet all this affords no reason for seeking the kindred of the Hungarian race in Central Asia; for the same philologist found in the only northern language to which his comparison extended, — namely, that of the Algonquins, who inhabit Canada, in North America, — a far more important resemblance to the Majar language, than in any of those already enumerated. It has been proved, also, very carefully by Gyarmathi, that the Hungarians have received much deeper and more influential impressions from their early intimacy with the Arctic tribes of the Finns, Lapps, Voguls, Votiaks, and other nations connected with these, than from any southern people; and that whatever they may have in common with the latter can be satisfactorily explained by their occasional wanderings towards the south, previously to their settling down in Europe.

It was on very different grounds that a number of ethnographers broke away violently, of late years, from the course of investigation dictated by the results of previous researches, and, instead of directing their steps to the north, which was emphatically pointed out to them, turned off to the Himalaya. This course of proceeding will have eventually, no doubt, a good effect, particularly as it will lead to negative results, and will prove that a corner of the earth, that was but little known till lately, contains the solutions of all riddles no more than any other spot. Men will be then brought back from the natural though unscientific attempt to establish a mysterious depôt for everything which being elsewhere undiscoverable, is yet absolutely requisite for framing a hypothesis; and they will cease to suppose that the Thibetian highlands, like Ariosto's moon,

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bring together by force of attraction every fact and phenomenon which escapes our waking senses. The pictures which Marco Polo and some modern travellers have drawn of the anthropophagy and uncouth habits of some of the tribes inhabiting Thibet, are not calculated to nourish the expectation of finding in that region the most fertile seeds of humanity in its collective form. But much will be eventually gained from these negative results; and as Geogony owes its most important consequences to its transformation into Geognosy, so will the science of Man find its safety in turning from those preconceived theories to patient observation.

There are two obstacles which seem specially to interfere with the advance of this most important branch of human knowledge, both arising from what may be called the sedentary education of our ethnographers, who are too much disposed to consider everything from the European point of view. As we find that philosophers often conceive a partiality for, and ascribe exaggerated influence to, certain phenomena, which they have made the objects of their particular attention, and, in this way, found theories of the earth on nothing more than the mineralogical circumstances of confined districts, so we find that the spread of Christianity — a consideration wholly European — is often taken, in the discussion of ethnographical questions, as the sole rule and measure of the argument: for in many instances, attention has been directed to the mountains of Thibet, chiefly on account of the supposed traces of Christian rites observable among the Buddhists.

Another still more evident and more influential consequence of notions originating altogether in European experience, is the propensity to have recourse, for the explanation of any intercourse which may be shown to have taken place between the in-

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habitants of countries at a considerable distance from each other, to what are called historical events, that is to say, to events limited and assignable in number, which may be supposed to have brought about at certain times the forcible and sudden contact of masses of population which were previously separate. But if, when inquiring after the earlier inhabitants of different parts of the earth, and their circumstances, we were to deign to bestow attention on the present and actually accessible occupiers of the same countries, and to decide the ethnographical problems having reference to them, rather in accordance with their modes of thinking than with those of Europe, it would then be seen that the marks of connection and intercourse would no longer be explained by hypotheses of violent removals, migrations and revolutions, but that those early phenomena were produced by that continual and voluntary movement of individuals back and forwards, which exists at the present day. It cannot be doubted that these oscillating, as it were, and slowly operating movements between a number of different and neighbouring races, accounts for widely spread analogies of language, manners, and modes of thinking quite as perfectly as, and more naturally than, the arbitrary assumption of progressive and overwhelming migrations.

In this northern part of Siberia, there is absolutely nothing at the present day calculated to countenance the belief that the inhabitants, driven by some convulsion, have come hither from the countries in the south: there is nothing which leads to the dogmatic assumption that neither language, nor anything else characteristic of a people, can have developed itself independently in the northern regions of the earth: for while one sees that the people who dwell here at the present are fully as well satisfied with their lot as the inhabitants of the tropics, it is hard to conceive

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anything which should have prevented the existence of the same state of things antecedent to history. But even if the opinion of those people themselves respecting their physical well-being be not accepted, and it be thought better to decide the question rather by a constant standard, appreciable by European taste and habits, still it will be obvious to every one that the wandering Ostyaks and Samoyedes, with their reindeer, are far better off than most of the aboriginal American tribes within or near the tropics. To say nothing of the far more perfect means of conveyance and the facilities of travelling enjoyed by the inhabitants of northern Siberia, the temperature of freezing mercury even is much less insupportable to the wearer of the *Park* and the *Gus*, than a heavy shower of rain to the naked Indian of California; and a meal of reindeer flesh and delicious salmon appears preferable by far to the lean lizards and mice, which the American Indians catch with much trouble, after having set fire to their prairies.

But, on the other hand, no one who has ever seen this country will be brought to imagine that it was the labour of man which gradually rendered it so habitable as we find it; or which called forth any of its more favourable circumstances; for culture has never been known to operate beneficially on reindeer collectively, or on fish or Polar bears, or on the wood which serves for fuel, or on the snow which covers the ground and makes the sledge-road; and the dogs for draught also — those humble, but most important dependents on the Siberian household — are manifestly nothing more than tamed wolves from the neighbouring tundras; so that, for their sakes also, we must not think of seeking a southern derivation for their masters.

During the intercourse which I had hitherto had with the Ostyaks, I learned, from every day's expe-

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rience, that it is only by dint of assiduous and successful observation of nature, that they have secured for their arctic abodes the possibility of comfort and exemption from care. But here I became acquainted with the productions of their contemplative leisure; with their intellectual efforts and the manifestations of their religious feeling. Music, poetry, and a very well-developed kind of pantomimic art, are here inseparably united, but as to the constant connection of all three with the popular religion, it can be affirmed only so far as every feeling partakes more or less of the religious character.

The Russians here knew nothing of the song which I had heard at Repólovo, and, except the first two words *Inga torum*, which undoubtedly mean "Water-god," it was beyond their powers of translation. In general, the traditional preservation of a poem seems to be rare among the Ostyaks, and their songs are for the most part improvisations, which they produce at the spur of the occasion, and always accompany with pantomimic action. It sometimes happens, that the same incident continues to be the favourite theme for years together, being treated, however, in various ways according to the individual taste of the singer. Thus, a bear having once dug up from the grave and devoured the body of a child, the Ostyaks, it is said, used for many years to describe in their songs this shocking occurrence, imitating with the greatest fidelity the growling of the bear, with its gestures and looks towards its pursuers, who were endeavouring to drive it from the corpse. The wolf and the bear, being looked upon as powerful and highly-gifted beings, figure quite as much as men in the Ostyak songs and pantomimic shows, and, like the latter, are sometimes the subject of tragic representation, but much more frequently of droll caricature. And with respect to the rank which these two beasts of prey hold in the esti-

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mation of the Ostyaks, it may be observed, that the homage rendered to them is not merely poetic, but assumes at times a decidedly religious character. When one of them has been killed, its skin is stuffed with hay, and the people gather round their fallen enemy to celebrate the triumph with songs of mockery and insult. They spit upon it and kick it, and that ceremony performed, they set it upright on its hind legs in a corner of the yurt, and then, for a considerable time, they bestow on it all the veneration due to a guardian god.

In accompanying these songs, and also on the occasion of the religious solemnities which shall be more particularly mentioned lower down, the Ostyaks make use of two kinds of stringed instruments, invented by themselves at some remote period. One of these is shaped like a boat, with five strings, and is called *dombra*, which furnishes another remarkable proof of the relationship of the Ostyaks to the Majars, for the latter have at the present day a precisely similar instrument, to which they give the name of *tombora*. The other Ostyak instrument, which is larger than the dombra, and has eight strings, bears the name of *naruista yukh Khotuing*, — an expression which the Russians interpret, not improperly, by the word *lebed*, "a swan," for such, in fact, is the meaning of the last term of the Ostyak denomination. It is obvious that in this instance the Ostyaks have had in view the well-known story of the singing of the swan, which is by no means without foundation, for the notes occasionally uttered by the Cygnus Olor, when in a state of freedom, and particularly during the spring, are, in fact, most beautifully clear and loud, and that this bird, when wounded, pours forth its last breath in such notes, is now known for certain. The popular songs of the Russians also, which are particularly rich in imagery derived from the obser-

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vation of aquatic fowl, celebrate perpetually the fine voice of the swan; and it is to be remarked, moreover, that the Chinese goose (Anser cygnoides), which the Russians domesticate, bears the title of *Swonkoi* or "sweet-voiced." Nay, it is even likely that the name of one of the most ancient of the Russian stringed instruments, the *gusli* or dulcimer, is derived from the word *gus* (goose), in a manner analogous to the Ostyak *Khotuing.* We shall show hereafter, that the national melodies of Kamchatka originated unquestionably in the imitation of the cries of sea-fowl. In the monotonous songs of the Ostyaks, one hears little besides the fundamental note and minor third, and more rarely, the fifth also.

Although an attempt was made by the Metropolitan Philophey, as early as 1712, to convert the people dwelling on the banks of the Obi, and a number of Ostyaks were baptized at that time, receiving, by way of reward or inducement, presents of European cloth, yet the government has never departed from the maxims of wise toleration, and the unconverted natives enjoy to this hour unmolested the free exercise of their ancient religious rites. Below Obdorsk great assemblies for the celebration of certain religious festivals are held at the river, while the more southern Ostyaks prefer resorting for these purposes to the woods and tundras, lying at some distance from the river, where they are joined by their nomadic brethren. It is the same with the Nisovian Samoyedes; for M. Ivanof told me that they often refused to furnish him with reindeer for his sledge, until he had expressly assured them that he was not come for the purpose of baptizing them.

They are shrewd, clever men, who, under the name of Shamanui, hold among the Ostyaks the office of intermediators between the people and their gods, possess the gift of divining and offer the sacrifices.

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They strengthen their reputation not unfrequently by delusive demonstrations of their invulnerableness; stabbing themselves, as I was assured by an Ostyak who had witnessed those feats, with knives in different parts of the body. The belief expressed to me at the same time by the Russians at this place, that these wonders are to be accounted for only by referring them to the direct inspiration and assistance of the devil, proves at once the bigotry of the Christians and the dexterity of the Shamans; and in this case, too, we see the most violently opposed extremes meeting, for the most orthodox of the Russians agree with the Pagans in believing in the miraculous powers of these priests. The hierarchy of the crafty Shamans is hereditary, for each of them transmits the dignity of his office, with the requisite rules of art for making sacrifices, his gifts of divination, and perhaps a few esoteric doctrines of religion, to the most capable of his sons, without regarding the right of primogeniture; or, if he be childless, to an adopted son.

The outward forms of religion, which are thus handed down among the Ostyaks from father to son, appear to be in themselves worthy of attention: for it is only by the attentive examination of them that we can hope to arrive at a probable explanation of the doctrines on which they were originally founded; but, independent of this consideration, I feel myself bound to produce all that I know upon this subject, in consequence of my having discovered, the following year, on the north-west coast of America, and having thoroughly learned, by repeated observation, a system of religious observances identical with this in every particular. In reference, therefore, to the most important of the Ostyak solemnities, for the performance of which they purchase arms, as already stated (p. 30.), I here give the literal translation of a state-

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ment made to me in writing by a Russian who witnessed them, and can most conscientiously assert that there is not in this statement the slightest trace of supplementary addition, or of any thing more than the representation of the fact; for this is attested by the complete agreement between the usages prevailing at Obdorsk and those which I subsequently witnessed, with much amazement, among the Kolyuses at Sitka.

"The Ostyak Shamans, like the taduibui or priests of the Samoyedes, bedeck their fur clothing with metal figures of birds, fish, and wild beasts, with the teeth and bones of sea-animals, and with whatever, in short, seems calculated to give them a terrific appearance. Their ceremonies of divination are performed before a fire, round which they go, crying as loudly as possible, and writhing as if possessed. They beat at the same time a kind of drum, and rattle their metal ornaments, while the bystanders also add their lusty shouts, and contribute to the clatter, by beating pots, or other such utensils with their weapons. After the din has lasted some time, the Shaman falls to the ground, whereupon the bystanders throw a cord round his neck, and cover him with skins, by which they would have it understood, that he is in communion with the spirits. Two men then take the ends of the cord, and pull it with all their might, while the Shaman, under the skins, slips his hands to his neck to prevent his being strangled. When at last he has had enough of the struggle, he makes a sign that the spirits have left him, and communicates forthwith to the company the required predictions. In 1805, it happened that a Shaman was in fact strangled in this way, and the affair was brought before the provincial tribunals. He was obviously too slow in placing his hands between his neck and the noose.

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"On the 27th December, 1821, (old style,) the Ostyaks kept a solemn festival in the yurts of Pashirtzof, five versts from Obdorsk, in honour of their god Yelan, and I obtained permission to be present at the ceremonies, though I afterwards nearly repented of my curiosity. The ceremonies began about eight o'clock in the evening, and lasted till two in the morning. At first, children ran round to each yurt, to call the Ostyaks to the divine rites. In so doing, they screamed in all manner of wild notes, and seemed as if quite beside themselves: this went on while the people were assembling in the yurt selected for the proceedings. On entering this, each of the Ostyaks turned round three times before the idols, and then took his place on the right side of the room, in the recesses, or on the floor. They talked to one another, or otherwise employed themselves as they pleased. The recesses on the left side were concealed by a curtain, behind which went certain persons, who on entering the yurt, turned round, like the rest, three times in front of the idols. At length, when all were assembled, the Shaman began rattling with the sabres and iron-headed lances, which had been previously heaped together before the images. He then gave each person present, (excepting the women, who were also behind a curtain,) a sword or a lance, while he took himself a sword in each hand, and placed himself with his back to the idols. The Ostyaks stood in rows lengthwise in the yurt, or packed in the recesses. They then all turned round three times, holding their swords stretched out before them. The Shaman struck his two swords together, and so they all began to scream out *Heigh!* in different tones as led by him, at the same time bending their bodies from side to side. This cry was sometimes repeated at wide intervals, sometimes in rapid succession; and with every repetition of the *heigh*, came

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the bowing movements, to the right and left; the swords and lances, in the mean time, were sometimes sunk to the ground, sometimes stretched upwards. This screaming and swinging about lasted for an hour, by which time the men became excited to such a degree, that I could not look without terror even in those faces which had at first appeared to me to be engaging.

"After they had screamed their fill, they became silent all at once, and ceased too from their oscillations; then turning round before the images, as at the commencement, they gave back the swords and lances to the Shaman, who restored them to their original position. The Ostyaks having settled themselves, some in the recesses, others on the floor, the curtain rose which had concealed the women, and now both sexes joined in dancing to the music of the dombra. The dance was by turns wild and comic; it was often very indecent also, and continued a long time. Next came forward some buffoons and posture makers, in various droll attire, and repeated the chief movements of the dance. At length the Shaman distributed again the swords and lances; the Ostyaks again reeled from side to side and cried *Heigh!* then turning round three times at the conclusion, and striking three times on the ground with the swords and lances, they gave the arms back to the Shaman, and went off to their homes."

I shall refrain from any further observation on these Ostyak usages till I come to relate the surprising rediscovery of them in America, where many details of the rites, as I witnessed them myself,—the remarkable dress, for instance, of the Shamans,—appeared in a more characteristically defined and significant light. It may be remarked, however, that an inquiry into the origin of the armed dance, which is usual in some parts of Hungary, seems very

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desirable, in reference to the ethnographical question already touched upon (p. 36.). By means of it, and through the intermediation of the Ostyaks, we might be able to arrive at a remarkable and characteristic point of contact between the Hungarians and the American Kolyuzes, and be led even to reflect on the relationship pointed out by Beregszaszi, between the language of the Hungarians and that of the Algonquins. Traces of communication between the Laplanders and the Tchuktchi cause no surprise, after the information we have received respecting the fair of Obdorsk, and more of the same kind learned from the Tunguzes. For it is easy to comprehend how the nomades of Turukhansk convey to their Tunguzian neighbours on the east, whatever they see or hear in the course of their dealings with the people of Obdorsk. But whatever reaches the Tunguzes is sure to be carried to the sea-coast, and is then propagated beyond the sea in consequence of that traffic between the Tchuktchi and the Americans, of which the ancient existence is attested by tradition. On the other side, it seems hazardous to think of deriving the American Kolyuzes from the Himalaya, for then the other aboriginal tribes of America, southwards to California, in the first instance, and afterwards still further south, will inevitably have to be all referred to the same origin, as members of one family.

A few remarks, founded on the reports of the Russians, respecting the dogmas of the Ostyak theology may as well be mentioned here, particularly as there are no tribes in Northern Siberia with whom we are so well acquainted, as far as regards their religious opinions, as with these. The Russians on the Obi owe their information on these subjects chiefly to one Grigory Novitsky, who accompanied the apostle before mentioned (p. 44.) in his journeys.

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among the heathen, solely with the view of acquiring accurate information respecting the original religious opinions of the proselytes. It might almost be assumed, that the religion of the Ostyaks, previous to their acquaintance with the Christians, was undergoing independently a process of complete purification; or else (which is indeed far more likely) that this people had gradually fallen away from the health of a sound faith — (to use the expressions of St. Augustine) — to the sickness of Paganism; for it is an incontestible fact — singular as it may appear — that the Ostyaks, notwithstanding the imperfect development of their religious services, have yet very correct ideas of a Supreme Being; for under the name of *Toruim*, they venerate a God, of whom, as they declare, they have never made a likeness, neither have they offered him a sacrifice. We have already found (Vol. I. p. 262.) the same appellation of the Deity among the Voguls, and indeed it may be recognised even in the Tor of the ancient Icelanders and Scandinavians. But here among the Ostyaks, and wherever else the Russians have met with this name, they found such ideas and opinions connected with it, as justified its being left unchanged in the process of conversion, so that there remained nothing but to bring the other and anthropomorphic divinities into neglect and oblivion, or to assign them a place in the dæmonology of the new creed.

It may be easily shown, however, that the corruption of the Ostyak creed was brought about by admixtures and additions dictated by the interest of the priests, and to which we find an exact parallel in what are called the Christian Legends, or more exact still, in the system of canonisation which was also introduced with interested views. The Shamans have always found in the pious feelings of the people some unguarded point whereon to fasten their gainful

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doctrines, for when a man dies and the body has been buried with a nart and reindeer for use in the next life, (which is done here as well as among the Samoyedes,) with a tinder box, and, among the Nìsovian Ostyaks, with a pipe and tobacco, they make his relatives form a rude wooden image representing, and in honour of, the deceased, which is set up in their yurt and receives divine honours for a greater or less time as the priest directs. The Shaman pretends to discover by examining the dead body, by divinations and adjurations, the cause of death, which he sometimes pronounces to be God's love for the deceased, sometimes the sins of the latter. To the women particularly is entrusted the service of these family saints. At every meal they set an offering of food before the image; and should this represent a deceased husband, the widow embraces it from time to time and lavishes on it every sign of attachment. Where the popular usages have not been disturbed, this kind of worship of the dead lasts about three years, at the end of which time the image is buried.

But when a Shaman dies, this custom changes, in his favour, into a complete and decided canonisation; for it is not thought enough that, in this case, the dressed block of wood which represents the deceased should receive homage for a limited period, but the priest's descendants do their best to keep him in vogue from generation to generation; and by well contrived oracles and other arts, they manage to procure offerings for these their family penates, as abundant as those laid on the altars of the universally acknowledged gods. But that these latter also have an historical origin, that they were originally monuments of distinguished men, to which prescription and the interest of the Shamans gave by degrees an arbitrary meaning and importance, seems to me not liable to doubt; and this is, furthermore, corroborated by the circumstance,

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that of all the sacred yurts dedicated to these saints, which have been numerous from the earliest times in the vicinity of the river, only one has been seen (near Samárovo) containing the image of a woman. When we consider attentively the life of the Ostyak, divided between hunting, fishing, and travelling far and wide, it is easy to understand that, here, the man is immeasurably more important than the woman, and consequently has a weightier claim to the grateful homage of posterity.

Ortik, Yelan, Long, and Meik are the proper names of some of these deified beings. The first of these, Ortik, possesses a peculiar interest for Europeans, for he is found in Hungary changed into Ordög, the proper name there given to the Devil. It was on the conversion of the Majars to Christianity, no doubt, that they were taught this new application of the old name, for the Ortik of their Ostyak Kinsmen is a beneficent being, a particular favourite of Toruim, and a friendly mediator on every occasion. His image, like that of all the other heroes, is only a bust without legs. The face is usually made of a hammered plate of metal nailed upon wood; the body is a sack stuffed with hair and skins, and with two linen sleeves sewed to it for arms. The whole figure is dressed in a linen frock, and is placed on a table with the sword and spear beside it. The Ostyaks make it offerings of furs, from which they occasionally borrow also, to pay the yasak, in case of necessity.

The images of Yelan are very like those of Ortik, but are generally distinguishable by the peaked shape of the head. They are often dressed with a cap made of black dog-skin, and the body is sometimes of bare wood, sometimes wrapped in linen. This is the god in honour of whom they perform the armed dance above described.

The part which Long plays is more peculiar, for

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every rare and esteemed art is under his protection, and the Ostyaks in consequence apply to him epithets, which the Russians conceive to be most adequately translated by the word *mastuir*, *i. e.* master. Along with other arts he presides over that of healing; but the offerings made to him by the sick must consist only of productions of art; furs are expressly excluded. The bits of cloth of every kind, which the Ostyaks procure in the course of their traffic for this purpose, they stuff into the sack which forms the larger portion of the idol; and this is furnished, characteristically enough, with one of those kushaks or girdles which, with their metal ornaments, are specially fitted to represent foreign art; but, instead of the small studs which serve to adorn the girdles of mortals, large, flat buttons of silver, if possible, are sewed on the girdle of Long.

A malignant and, perhaps, somewhat more allegorical character is ascribed to Meik, for it is conceived to be his fault if a man loses his way in the woods or during a snow-storm; and, in such cases, promises of worship and offerings are sure to be made to his image by the Ostyaks. The block which represents him is dressed, without further decoration, in a *park* (Vol. I. p. 488.) of beaver skins. If the statement be true that, in former times, there were to be seen in some of the sacred yurts of the Verkhovian Ostyaks metal mirrors set before the idols, as in the Buddhist temples, for the purpose of consecrating the water by reflecting on it the image of the god, we need not be surprised at finding such a mixture in so flexible a ritual as that of the Shamans. At the present day, however, the Nisovian Ostyaks have no knowledge of such a custom.

Respecting the rich and remarkable offerings which the Ostyaks deposit at their holy places, many strange stories are told here in Obdorsk. It is said

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that silver coins, nay, even wrought gold and silver, are to be found among them; and that the value of such deposits has sometimes amounted to 10,000 roobles. The pillage of them is strictly prohibited by the Russian government, and a Kosak, convicted of an act of sacrilege of this kind, is condemned to labour in the mines. Besides making these gifts, the Ostyaks sacrifice also a great number of reindeer, and always in the manner of a bloody atonement; for, with deliberate cruelty, they kill the animals slowly, by stabbing them in different parts of the body, or suffocate them by repeatedly plunging them in water.

It would be interesting to compare the religion of the Ostyaks with that of their neighbours, the Samoyedes; but owing to the limited intercourse maintained with the latter people, by the inhabitants of Obdorsk, there is but little known in this place respecting their customs and opinions. This, however, is certain, that the Samoyedes, who have always kept themselves aloof from, and undefiled with, the Buddhistic and Mohammedan dogmas prevalent in Southern Siberia, maintain, with the Ostyaks, the principle of an everlasting God, whom they call *num*, and of whom they declare expressly that his likeness cannot be made. Their prayers are *num tad*, and *num arka*, "God gives," and "God is great." Their *tadebzii*, or, as they are erroneously styled, demigods, are evidently only mediators, supposed to approach the deity, or ministers of the divine will. The representations of these *tadebzii* are the *Khaye*, or images which we find set up on the Island of Vaigatz and other parts of the northern coast, to which reindeer are sacrificed to procure good luck in hunting; and from which the Samoyed name of that island, *Khayodeya*, or "land of idols" is derived. The polar bear, as the strongest of God's creatures, and that which seems to come nearest to the human being, is as much

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venerated by them, as his black congener by the Ostyaks. They even swear by the throat of this strong animal, whom they kill and eat; but when it is once killed, they show their respect for it in various ways, and will not, for instance, allow a woman to taste its head. They believe that fumigations with the fat of the polar bear afford the best protection from the harms which might befall them in hunting, owing to the ill wishes of an enemy, or the vicinity of a woman.

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CHAP. III.

FISH OF THE OBI. — MIGRATORY SPECIES. — THEIR ASCENT OF THE RIVER. — DEATH OF THE OLD FISH. — PREDATORY DOLPHINS. — ESTIMATED NUMBERS OF THE FISH. — PRODUCE OF THE FISHERY. — IRREGULAR REFRACTION. — TEMPERATURE OF THE GROUND. — EXCURSION TO THE MOUNTAINS. — A SAMOYED FAMILY. — LIFE IN THE WINTER TENT. — PECULIAR DESIRES OF THE REINDEER. — GRAVE DEMEANOUR OF THE NORTHERNS. — THE RIVER KHANAMI. — THE ROCKS. — SAMOYED DRESS. — THE MOUNTAINS OF OBDORSK CONNECTED WITH THE URAL. — ELEVATION ATTAINED.

December 10. — We had another storm of snow from the mountains in the west. On this occasion the temperature of the air rose to — 8·5° R., and the atmospheric pressure diminished constantly. About two in the afternoon the mercury in the barometer stood about 0·76 of an inch lower than during the east wind of the preceding and following days. We penetrated with the auger, by noon to-day, to the depth of seventeen feet; but the thermometer, after remaining some time in the ground, rose no higher than — 0°·45 R. It was manifest therefore that there was perpetual congelation here at this depth; yet we continued boring on this and the following days, and then finally sank the thermometer to the depth of 21·5 feet, taking care to stop the orifice of the bore above with felt and mats.

The ichthyophagic habits of the inhabitants of Obdorsk necessarily reminded us of the fisheries of the Obi, and the curious particulars of natural history connected with it, and we had no difficulty in collecting much valuable information. The constant inhabitants of the waters of the Obi are chiefly pike, perch, bleak, and red mullet; but it is only above

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Beresov that any value is set on these, and even there they are of far less importance than the yearly visitors from the sea, or, as they are here called, the migratory fish. In the first weeks of June, immediately on the breaking up of the ice at the mouth of the Obi, the sea fish commence their movement from the estuary up the river; these are chiefly the sturgeon, the nelm, and muksum (different kinds of salmon), the burbot, the salmons here called súirok, shtchókur and puidyan (*Salmo vimba*, *S. tchókur*, and *S. polkur*), and the herring. With the exception of the last three, these fish spread themselves through all the upper waters of the river, even as far as the government of Tomsk, where they must be 1200 miles at least from the mouth of the river. The puidyan salmon, and the greater part of the tchókur, turn westwards between Kushevatsk and Beresov (in 64°·8 lat.), by the river Suinya to the Ural, and remain near the sources of that stream the whole winter; while in the lower part of the Obi the samor, or death, takes place, as has been already stated (p. 2.). Of the herrings also it is said, that they turn to the mountains by the Sosva and Suigva at Beresov, and spend the winter in fresh water; but they are found in abundance in the Obi as late as August and September.

In swimming up the river, the fish all avoid the rapid stream, and prefer particularly the *protoki* (see (Vol.I.p.409.), or lateral arms of the river, without any current. They halt also on the sandbanks or shallows, here called *peski*. But the unequal powers of motion of the several species soon becomes apparent, for, fifty versts below Obdorsk, the different kinds of fish always make their appearance together. On the first day after their arrival they swim separately, and but few are taken. From the second to the fifth day, they proceed altogether in crowded shoals, but in a week's

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time the river is again quite deserted. One hundred and fifty versts above Obdorsk (220 versts from the estuary), the quick swimmers are by this time already arrived in considerable numbers; the súirok or vimba salmon is the first seen, two days later the nelma makes its appearance; the sturgeon and the muksum do not arrive till five days after these. This difference of speed is still more perceptible in the arrival of the several kinds at Beresov (400 versts from the river's mouth), for there the first súirok is seen, generally about ten days before the first nelm-salmon, fourteen days before the sturgeon, and thirty days before the muksum; respecting which it is known, that, in ascending, it likes to spend some time in the still waters of the *Sori*, below Beresov.

It ought, however, to be understood, that these statements as to time, in reference to the river above Obdorsk, are applicable only to the first fish that arrive of the several species, for many individuals of every kind, but especially of those that swim slowly, remain the whole winter between Obdorsk and Beresov. Here they seem disposed to rest, but, if frightened, they are sure to go up the stream. The bed of the river below Obdorsk seems alone to be avoided by every kind of fish, as soon as the breaking up of the ice allows them to escape from it; and it is obvious, that the part in question has too much of the character of the sea, which the fish are then hastening to quit, for a heavy swell runs through it, and there can be no doubt that the water towards the bottom is there brackish.

With respect to the object of that remarkable instinct exhibited in the migration of these salmon, and several other kinds of fish, it is here, on the Obi, perfectly well known, that they bring forth their young only in the fresh water, where they spend some months in breeding, for the sturgeon alone is found

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with a fully developed roe below Beresov; but between this place and the sea, the roe of every other kind of fish, if traceable at all, is very meagre and immature. It is not till they reach the neighbourhood of Kondinsk, at Samárovo and up the Obi, as far as Surgut, that these fish have invariably roes fit for making caviar; but even in that quarter, it is known to the fishermen, that the eggs are larger and riper the further up the stream the fish is taken; and fish, the brood of the same season, are taken at the beginning of winter, in the vicinity of Tobolsk, where they serve to bait the self-acting hooks (see Vol. I. p. 406.) for the sturgeons. But as to the time when this young brood descend from the sources of the rivers to the Polar Sea, as to their proper element, the fishermen can offer no direct testimony; which is a sufficient proof that this important event in the history of the migratory fish coincides with the annual interruption of the fishery, and, consequently, falls between the months of January and June. Of the parents of this brood, however, those alone which have ascended furthest, and have first deposited their spawn, can possibly return to the sea; the rest, which reach in their descent only the middle portion of the river, there end their lives by what appears to be a general malady; but perhaps the true view of the matter is, that the sea is deserted annually, not by all the individuals of every kind of salmon, but only by those of an advanced age, a considerable number of which are not merely impelled by instincts, connected with the business of procreation, but also await their death (under any circumstances not far distant), in the calm waters. How intimately the economy of the bears corresponds with this phenomenon will be mentioned lower down, when we come to speak of the rivers of Kamchatka, and of the streams flowing into the bay of Okhotsk.

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Warm-blooded inhabitants of the ocean also, dolphins (*Delphinus leucas*), share with the cold-blooded, here in the Obi, the custom of ascending into fresh water. It is no peaceful instinct, however, which prompts their movements, but predaceous purposes, which are calculated to quicken the flight of the fish. The dolphins do not show themselves in equal numbers every year, but they always follow close upon the fish about the middle of June; and it is said that they sometimes occupy the whole breadth of the river, forming a train five versts in length. They then gradually spread themselves up as far as Kunevatsk, 260 versts from the mouth, but, in the mean time, many of them turn back, and in so doing begin their attack on the ascending fish. When they appear in great numbers, the fish, not only at the places where the dolphins are approaching, and even for some days before their arrival, are so terrified that the fisherman lays his lines for them in vain, but in such years there is a great failure in the fishery even far up the river. It is not surprising that even sturgeons dread these persecutors, for the dolphins here are said to be not unfrequently twenty-eight feet long. They do not return to the sea till September.

If the river were fenced across with stakes, the ascent of these voracious creatures might undoubtedly be prevented, without (as experiments made in Kamchatka prove sufficiently) operating prejudicially on the migration of the fish; but in so great a river as this, such means of protection are impracticable, for in summer, when the floods are at their height, and when the fish, in their movement up the stream, are most abundant, the great Obi is never barred by salmon weirs; and even in the less branch, the Ostyaks are accustomed to construct at this time of the year weirs projecting only about 120

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feet from the bank: but a complete barring across the river is resorted to by them only in autumn and winter, when the water is low. The Russian fishermen have never succeeded in taking dolphins in the Obi, for, when these animals are caught in nets, they often allow themselves to be drawn quietly till near the bank, but the moment they are sensible of imminent danger, they tear the cordage asunder with the greatest ease. But the Ostyaks, who prefer the skin of this animal above any other for their reindeer harness, are expert in killing it both on the sea coasts and in fresh water. In particular, the Ostyaks dwelling on a protok, or lateral arm of the Obi, below Obdorsk, give their attention to this business; after the arrival of the dolphins, they construct a fence across the shallow channel; behind this fence the animals congregate, and linger till the annual fall of the water, when they are taken with short and very strong nets.

According to the data furnished by those Russians of Tobolsk who annually carry on a very productive fishery on purchased or hired parts of the lower Obi, some judgment may be formed as to the proportions which the various kinds of the tenants of the water bear to one another: thus, for every sturgeon, there are taken 6 nelms, 80 muksums, and 104 of the smaller kinds of salmon and other fish; and with respect to the weight of the produce, the sturgeons, nelms, smaller fish, and muksums are nearly in the ratio of the numbers 5, 7, 42 and 112. The weight of a sturgeon may be taken at 50 pounds on an average. But as to the absolute production of the yearly fishery in the Obi, it is impossible to do more than estimate its minimum amount, because the most considerable portion of it — what is taken by the Ostyaks — lies beyond the reach of direct calculation. It is certainly a very moderate assumption, that each

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of the 60,000 aboriginal inhabitants of the government of Tobolsk consumes daily one pound of fish for his own support, and two pounds for his dog; and that of the 480,000 Russians, each requires an allowance of one third of a pound of fish, from which we deduce an annual consumption of 113,000,000 of pounds; but this amount of weight, supposes, according to the proportions stated above, 26,000,000 of individuals collectively, of the several kinds mentioned. Now, if we conceive these fish alone, which are, in fact, subsequently caught, to be entering for seven days, as already mentioned, the mouth of the Obi, at a place where the transverse section of the waterway hardly exceeds 50,000 square feet, then it would follow, that only one fish per minute passes through every space of 18 square feet; but it is manifest that the crowded shoals of fish which are seen below Obdorsk at the breaking up of the ice, will allow of a much denser throng of inhabitants for the upper part of the river.

We had to-day, as we wanted to get our reindeer clothing repaired and improved previous to starting on our journey, an opportunity of observing, as on several previous occasions, how many of the handicrafts, here usual and indispensable, are never learned by the Russians, but left by them wholly to the Ostyaks. We were obliged to call some Ostyak women to our assistance, for they alone know how to cut the furs and to sew with filaments of reindeer sinew.

December 11.—Wind and snow were at an end, and with a temperature of —22° R., and a gentle breeze from the S. E., we had a cloudless dark-blue sky the whole day. The chain of mountains now appeared quite distinct, but in very different colours, for the side towards us had been covered with snow during the last two days; and towards noon, as the sun rose above the horizon, they had the reddish glow of the Alps in the morning and evening. The

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whole mountain chain embraces an extent of 40°, or a ninth of the whole circle of vision. At either end it sinks abruptly to the horizon, and is also divided by deep chasms into five separate groups.

An undulating motion of the air, which propagated itself in the direction of the wind, was remarkably conspicuous while the sun was in this low position, whenever the telescope was pointed to the adjacent hills. In temperate climates this phenomenon is ordinarily observed during the morning hours of the hottest summer's days, because then, under the influence of the sun, heated air or light vapours rise from particular portions of the ground to mix with the colder or denser strata, and pass along in lines parallel with the wind. The rays of light which are at right angles to the direction of the wind, are then seen to undergo interruption according as they pass through colder or warmer portions of air. But no tremour or change of direction is observable in the rays, the direction of which is parallel to that of the wind, because they continue in a uniform medium, and are affected only by radiation from the same portion of the ground. In the case before us, the relation of the tremour to the direction of the wind was equally manifest; but still there is room for doubting whether the horizontal rays of the sun, skimming over the surface of the snow, were capable of producing a sufficient difference of temperature, or whether we must have recourse to the supposition of masses of air remaining behind in sheltered hollows from the warming snow-storm of yesterday, and mixing in lines, under the influence of the wind, with the surrounding atmosphere, which is 15 or 20 degrees colder.

In the afternoon, the Kosaks whom we had sent to the west returned to Obdorsk, bringing with them two Ostyaks on reindeer-sledges. They stated that

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on the road to the mountains they had left a tent, which we might take possession of and carry on with us. They then spoke very earnestly of the danger of ascending the mountain at this time of the year, for snow-storms are now frequent, and when they occur, no tent can stand on the mountains, but is sure to be torn up and shivered to pieces when most needed. Yet we had been previously assured, that in the very depth of winter the Samoyedes come to the annual fair directly across the mountains, so that there can be no doubt as to the possibility of ascending them.

In the evening some transits of stars were observed, both for longitude and latitude, with a very favourable sky, and then, in the open air, with the thermometer at — 25° R., we measured carefully a cord 210 feet in length, for the purpose of determining a base for the measurement of heights on our way to the mountains. The circumstances which rendered this labour fruitless will be related in the sequel. The thermometer, which had been lowered into the bore, having remained for a sufficient time at the depth of twenty-one feet, was now removed, and the temperature of the air being — 25° R. it was found to stand at — 1°· 67 R., or not quite so high as at a less depth; and as it is established by universal experience that the annual variations of temperature never reach to such a depth, a new proof was obtained of the fact that the ground at Obdorsk is perpetually frozen.

December 12. — By nine o'clock in the morning the Ostyaks already mentioned brought three narts fully equipped; they were of the longish form described above. A much prettier kind of sledge which we saw here, in Obdorsk, and had previously seen with the Nisovian Ostyaks who possess deer, is of Samoyedic origin, and is used by the Ostyaks but seldom, and only when their loads are very light.

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The runners of these Samoyedic vehicles are shorter and wider apart than those of the Ostyak sledges, and the shell-shaped seat, leaning forward, has a raised margin, and stands from three to four feet above the ground. The instruments were tied on the nart intended for me, and were covered with reindeer skins, the barometer being carefully fastened in an inclined position; the same, indeed, in which I had brought it uninjured from Tobolsk to this place.

Instead of the Kosaks of Tobolsk, who had hitherto served as interpreters in all our intercourse with the Ostyaks, we were now obliged to take with us one of the inhabitants of Obdorsk, because these people alone are familiar with the jargon which has sprung up from the intercourse of the Nisovian Ostyaks with the Samoyedes of the coasts and mountains, and in which their traffic is carried on. Our Ostyak drivers were two extremely well-built and vigorous men. Their clothing, reindeer, and sledges, all bespoke comfortable circumstances. It was here only, where the example of the Russians made a deep impression on them, that the love of brandy awoke within them as an overwhelming and insatiable desire; for after we had given them some drams, it was only by the most decided refusal that we could put an end to their passionate entreaties, and induce them to set forward. But it was curious to observe how quickly and completely this passion subsided in the course of the journey, and how the demeanour of morbid hankering gave way to that of calm and enduring strength.

With a perfectly clear sky, and the thermometer at $-27°{\cdot}5$ R., we set off just as the sun was rising (11h. 18m.), from the houses on the ridge into the valley. At first we travelled on the ice of the Polui, between hills deeply cracked with frost, and then straight across the Obi, on an undulating, and, for the

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most part, apparently ascending, plain. The Ostyaks had promised to take us to the most northern of the five groups of mountains; but, in this trackless waste of snow, our course now was straight to the fourth division of the chain (N. 18°·7 W.). In the valley of the river, on the slopes of the banks, we saw two ptarmigans running: they were not at all shy nor frightened at our sledge, although we were close to them before we descried them, their white plumage being hardly distinguishable from the snow. They seemed to be seeking food in the willow bushes, which make their appearance at the borders of the valley. On the dry level over which we now proceeded, were standing the thick stems of leafless larches, all of straight growth; yet they had in no instance reached a height exceeding twenty feet, and they stood generally separate, with such wide and equal intervals between them, that one could easily drive through them in all directions, with four reindeer abreast.

After a hard trot we reached the promised chùm, or tent, just at sunset; that is to say, in an hour and a half from our first starting.* This portable dwelling was, in form, exactly like that which we had seen at Keegatsk, but its inhabitants had a novel and foreign look. It was a Samoyed family which we had now joined, as guests, and the Ostyaks who had brought us here, were become its inmates only for the continuance of our journey, for the purpose of increasing the stock of reindeer at this station. We at once perceived, in the clothing of the Samoyed woman of the house, a variety of fashion never seen among Ostyak women; for it was made, not of reindeer skin alone, but of furs of different kinds, sewed together, so as to give the effect of colour and contrast.

* To-day, at Obdorsk, the sun was above the horizon one hour and twenty-four minutes, and attained an elevation of 21′.

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An unexpected misfortune damped at first the interest which I should have taken in my new acquaintances, for on unpacking the barometer, which I had brought with me from Tobolsk, for the purpose of hanging it up in the tent, I found it broken. Previous to my departure, and while in the house, I had closed the cistern, and as, when the instrument was afterwards brought into the open air, the mercury cooled nearly to the freezing point, it went no further into the tube, which it broke, owing to the jolting of the nart; this was a loss which it would require time and leisure to repair; but, on the present journey, the atmospheric pressure was determined, and, with it, the difference of height of the chief points on the mountains, by observing the boiling point of water, with a thermometer fitted into a copper kettle for this purpose.

Already, at our arrival, we found the herds collected near the dwelling, and in a few minutes our hostess had taken the skins off the tent, had folded them up, and fastened them, together with the tent poles and two pots or kettles, on a long nart; she, with her child, occupying a second, while the men packed themselves into three other sledges. But, besides, as our caravan got into motion, there was to be seen, also, a long train of free reindeer following the sledges. I now had a compass in my hands, and found our course to be N. W. for the first two versts; we then crossed a small river, called by the Samoyedes Khanami, which turns at this place to the E.S.E.; after which we proceeded in the direction of N. 15° E., or directly towards the first or most northern group of mountains. The bed of the Khanami was here about thirty feet high, encompassed by hills of fine talcose mould. The ground, as we went on, continued to present similar inequalities, and the bare stems of uniformly scattered larches as

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heretofore. About 5 o'clock in the afternoon, when there was a very faint twilight, we saw, on the western sky (N. 56° W.), a very bright ball of fire fall downwards, with a greenish light. The Ostyaks called this phenomenon *Khosil pites*, and the existence even of such a denomination would be sufficient to refute the often repeated assertion, that meteors of this kind are much rarer in the north than in middle latitudes, if frequent and direct experience were wanting for the same purpose.

After a good journey with the reindeer we halted at about 5 h. 30 m. on a level spot. Our drivers began busily to grope with their hands in the snow, and on pulling out tolerably large patches of lichen, the place was pronounced suitable for a night's station, and the reindeer were immediately unharnessed and turned loose. One of the men then cut down a stem of larch, which he split into small pieces for fuel; the rest of the business devolved on the woman. She picked out two of the tent poles which were tied together at the upper end with a flexible thong, and set them up in the first place, leaning against each other, with their lower ends in the snow; the other poles were then ranged round the junction of the first pair, so as to form a conical frame with a basis fifteen feet wide, and on one side an open space of about two feet was left between the poles for the door. In covering the tent, the same principle was followed which is observable in the Ostyak clothing, for immediately on the poles was a layer of skins, with the hair turned inwards, like the *Malitza;* while a second layer, like the *Park* or *Gus*, covered that, with the hairy side turned to the air. For this purpose, long, ready-lined strips of reindeer skin are permanently sewed together, and were in this instance very cleverly wrapped over the tent-frame. This is done by two persons, who hold up,

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with poles, the two ends of the skin-covering till it is nearly on a level with the top of the frame. Then one of them goes on with his pole, round the tent, till the skin is wrapped in a spiral form close upon the frame-work. The different pieces were thus laid one upon the other, overlapping at the borders like roof-tiles; and, without any fastenings, they kept their places by their weight, which contributed perhaps not a little to hold the frame-work together. We have already described how the door of the tent is formed by the lower end of one of these leathern pieces. At the height of about four feet from the ground, the woman now fixed two horizontal cross-sticks to the tent-poles to support the kettle. Then she kindled a fire and fed it with chips of wood which lay on a box filled with sand, in the middle of the tent. One of the men, in the mean time, had thrown up the snow with a wooden shovel which they carried with them, till it was about a foot high round the tent, and, as there was a great deal of smoke inside, he made an opening in the cover towards the wind; at the top, also, where the poles met, there was a space left uncovered to carry off the smoke. In the interior of the tent, the snow was covered in one place by a rush matting, which was the owner's seat and bed. For the guests, reindeer skins and fur clothing were spread upon the snow in the remainder of the tent.

In half an hour after our arrival the fire was burning cheerfully, and the most important preparations were complete. Then the party, all in good-humour, entered the tent together, and seated themselves round, with their backs to the hairy covering and their feet to the fire. Here, too, the men stripped the upper part of the body and covered with the furs only their backs, which were leaning against the cold sides of the tent; but the breast was exposed naked to the

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fire, and was in this way more quickly and sensibly heated by the radiation. I observed among the Samoyedes of our party an important deviation from the Ostyaks in their clothing, for their frocks or shirts were slit down in front, like a Tatar khalat, being kept close by the girdle, one side wrapped over the other, in the open air; whereas, now, the two halves were thrown back to lay bare the breast.

It was now time to think of filling the stomachs of the party, and here, again, the trouble fell on the woman. She fetched, from some distance, three masses of pure, untrodden snow, which she put into the kettle over the fire, to get in the first place water to drink, which was afterwards kept in a corner of the tent; and, when that was done, a porridge was made, in the second kettle, with the meal which the Samoyedes are in the habit of carrying about with them in sacks during the winter. But they do not proceed every day in the same manner, for they sometimes add reindeer's blood to the meal, or some dried and pounded fish; but the flesh of the deer they always eat raw, whether it be quite fresh, or old and frozen. The moment the repast was done, two of the men went out to watch the herd, which had already gone to a good distance; and, as they said, to protect them from wolves. For this purpose they had no arms but lance-shaped staves: after an absence of some hours they returned, and others went out in their place.

We now learned for the first time the particular circumstances of our company. The chùm or tent belonged to the eldest of the people, a Samoyede, about sixty years old. He was distinguished by the peculiarities of dress already mentioned, and also by a white beard, drawn to a point, which projected forwards from under his chin. I never saw the like among the Ostyaks. He was, like the rest of the

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men, tall; and from this circumstance, as well as his years, he was strongly contrasted with his wife, who was very little, and only twenty years of age; a child only two years old—a boy—shared in the wanderings of this family. The mother was still suckling it, yet it ran about quite independent, and was able to express its desires in articulate words.

Of the fifty reindeer which at present formed our herd, twenty belonged to the Samoyed couple, who had left, as we were informed, on the sea shore towards the north, another tent, with relatives and reindeer. They spend the summer in that quarter, but were at present drawing close to Obdorsk on account of the fair, changing their place of encampment daily, in order to procure fresh moss for the reindeer. Of the four younger men in our party, two only seemed to give a preference to the Ostyak language, and to use it between themselves; the other two had adopted the Samoyed tongue and clothing, either because they were descended from, or had their chief traffic with, that people. They had quitted their homes with thirty reindeer, as already stated, only for the period of our journey. They had all a blooming and healthy complexion, such as I had but rarely seen among the Verkhovian Ostyaks; they were, at the same time, broad-shouldered, and hardly under five feet ten inches, for they stood full as high as our Obdorsk Kosak, who passed for a tall man even among the Russians.

As soon as they were filled they ceased talking around the fire, and each stretched himself on the ground, wrapping himself up carefully with his fur garments and other skins. This proved to be a complete protection, for the people slept soundly and tranquilly, and yet the snow beneath them and immediately around the tent, was at the low temperature of —28° R; the passage for the smoke, also,

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at the top of the tent, remained open, and the influx of cold air from above could have been checked only, while the fire was brisk, by the ascent of a warm current.

December 13.—As early as five o'clock in the morning, after a comfortable sleep of seven hours, the inmates of the tent all awoke. A few embers were still glimmering on the little hearth and helped to the speedy revival of a blazing fire. While waiting for the dawn we made some tea, and the Samoyedes breakfasted on porridge and reindeer flesh. Two of the men then went out to collect the herd preparatory to our departure. The sky was still quite clear, but it blew hard from the mountains in the north.

I had already had occasion to remark, at different yurts, the remarkable longing which reindeer have for man's urine, but I had never seen it exhibited so distinctly and decidedly as to day; for just to gratify this desire, some of these shy animals had spontaneously come close to the tent, and as soon as any one went out to make water, they ran up in full trot to catch the stream in the air, with their under lip protruded; and if the first were driven back, then others hastened forwards and kept licking with avidity the wetted snow. It is manifest, therefore, that it is not the warmth of the fluid, but its saltness which awakens this desire, as we sometimes observe it in our he-goats; but in so extraordinary a degree, that the taming of the reindeer, or the power of habituating them to their masters, seems to depend essentially, or perhaps wholly, upon it. In no other case do they lay aside their natural shyness or their apparent aversion to man; for they will not eat from the hand, however good the fodder, and if fresh moss be plucked and thrown to them on the snow, they only smell it and turn away.

At present, and indeed even yesterday, on our first

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arrival here, the only visible and apparent inhabitant of the country around was a magpie, which, nevertheless, might possibly have followed our train from a distance unobserved. Throughout our journey we had not seen nor heard a living creature, except the two ptarmigans, and it could therefore be hardly considered as accidental that this bird should alight close to the sledge, before even the tent poles were set up, and remain constantly in sight till our departure. It is manifestly owing to surprising apparitions of this kind, in the most desolate places, that the magpie and other birds of the raven kind, are invested by the Samoyedes and Kamchadales with a magical character, and are favourite objects of their pantomimic representations.

Some brandy which I gave the Samoyedes yesterday evening, was the cause of my being plied now with very urgent entreaties, which the old Samoyede backed with a present of a perfectly white fox skin. I then offered them my pipe to smoke, which the Ostyaks refused at once, but the old Samoyede took it, as he had done the brandy, sluggishly, and with apparent indifference at first, but he afterwards asked for it again and again. The temporary want of tobacco could alone have weaned him from this habit, for he did not proceed like a novice, but drew the smoke long and deep, and swallowed it completely. It is remarkable that the very composed and grave manner of the inhabitants of this part of the world never deserts them, either in familiar intercourse, or in the midst of their enjoyments; for, although we admit that, in general, men who are not far removed from a state of nature laugh less than Europeans, yet, even in this respect there is a wide difference between the seriousness of the people here and the lively gaiety of the Tunguzes, or the ever-cheerful and very refined irony of the Kamchadales.

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The reindeer were now driven in, but only three long narts were yoked, for we were to go on to the mountains with the young men only, while the rest of the company promised to wait for us in this place till evening with the tent. We set off on level ground again to the first group of mountains, and in a short time reached the ice of the Khanami, the bed of which must have been at no great distance from us, on the right, during the latter part of our yesterday's journey; but here its course is from west to east, and we were travelling along it on the ice, upwards, when, on a sudden, and quite unexpectedly, I saw the right bank of the rivulet on our left, formed by extremely picturesque rocks. It is seldom that one sees so sudden a transition from alluvial land to the boldest cliffs, for we were hardly above a verst from a point on the Khanami, where both banks are formed of low hillocks of mould, as was the case where we crossed the river yesterday; and still there was no trace on our right or the left bank of the river of rocks *in situ*, or of considerable hills: the cliffs on the right bank sank here precipitous to the bottom.

The rock rose in tabular masses twelve feet thick, and reared perpendicularly; beneath, it lay concealed under heaps of fragments and snow, but above it was quite bare. The sledges staid on the ice, while we climbed up the slope to examine the mineral more narrowly. It was an extremely hard crystalline greenstone. At first, feldspath and hornstone were to be seen separate in larger crystals, and then higher up they were of finer grain, and the rock was traversed by veins of crystalline quartz. Above our heads the rocks rose still more abrupt, and the highest point was probably 300 or 400 feet above the level of the Khanami. The tabular masses of rock stood perpendicularly, and were very regularly directed

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towards the N. 34° E. (true north; by compass N. 20° E.)

Having thus made our first acquaintance with the rugged margin of the remarkable mountain-chain of Obdorsk, we were obliged to quit the rocks, for all the slopes on our left were much too steep to allow us to think of reaching the mountains by a lateral route, and, on our return to the ice, besides, our attention was engrossed by very different objects. The brushwood of leafy trees which grew on our right, close to the river, as well as on the picturesque rocks, lent to this spot the character of an oasis of higher organisation in the midst of the Arctic wilderness; but this charm was now most unexpectedly and significantly enhanced, for, looking up the river, we saw on the level of the right bank, four Samoyed tents, and, in front of them, groups of people, vividly relieved, by colour and motion, from the uniform expanse of dazzling snow. Our sledges were immediately directed to them, our drivers disclosing their intention of begging for a relay of fresh deer; but they were disappointed in their hopes, for we were received with the information, that the wolves had attacked in the night and dispersed the herds feeding in the neighbourhood. Some men had gone out to collect them again, and the people here were awaiting the result. One of the killed deer had been already brought to the tents, and the group which had attracted our notice at a distance, was in fact assembled round the carcase. The back of the animal's head was gnawed open, and the brain taken out, but the face was not torn, nor were the ribs broken.

There were several women in this company of Samoyedes, and, like our first fair acquaintance of that nation, they were all of diminutive stature. The men, on the other hand, were tall and slender; but,

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besides, the sexes were strikingly distinguished by their dress; for while, among the Ostyaks, the shape of the park and malitza is the same for men and women, here the garment of the male is always made to open at the breast, while the women, on the other hand, wear a short pellisse; which, without the Ostyak hood, reminds me, by its appearance, of the old Russian saraphán, and is made of various coloured skins of dogs, wolves, and gluttons (*Ursus gulo*), sewed together; nay, is often adorned with stripes of European cloth. A glutton's tail hangs down at the back of this garment; and, furthermore, these finery-loving dames wear, instead of the veil of the Ostyak women, a hat of similarly varied furs, with broad lappets falling down at both sides, and on the back of the neck, and which bears some resemblance to a European helmet, as well as to certain head-dresses of the Tatars and Burāts. And then their hair, hanging down behind in queues beyond the hat, is the object of particular care. They fasten to these queues metallic ornaments of every kind, which jingle at the least move. But the Samoyed women, in complying with this fashion, think nothing too costly; and I saw a woman here wearing, at the end of her tresses, along with a number of iron and brass rings, the lock of a musket, rusty, indeed, but in other respects quite perfect.

These tent-Samoyedes employ reindeer alone for draught, and a number of little dogs which I saw with them here were not intended for harness, but only for the women, who kill them for the sake of the skin. They were all still young, and though from this circumstance it was impossible to form a judgment as to the regular, full grown size of the variety, yet it was obvious that they belonged to a breed totally different from that of the Ostyak dogs. They had all long hair, of a fox-red colour, which I had

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never seen among the dogs of the Obi. They differed from the latter in their behaviour also, for they flew at strangers and kept yelping at them in shrill tones. It can hardly be doubted that this breed is derived from foxes, and not, like that of the Ostyaks, from wolves.

We did not wait for the return of the men who had gone in search of the herds, but we went two versts down the Khanami, which from this place cuts through the mountain range in the direction of its length; and then turning to the N. W. we ascended boldly up the slopes of the rocky ground, which rose before us in somewhat less rugged forms. It was now evident that these mountains are formed of step-like strata, for we often imagined that we were reaching the highest ridge, but on going a little further we descried new and more elevated summits, which had been hitherto hidden from us by those that were nearer. The rock beneath us was a primitive slate, the strata of which were directed steeply upwards in the direction of our path. Finer pieces of it were broken off by the effects of weather, and lay scattered on the slopes. A great variety of lichens of every colour were flourishing in them, but on breaking pieces with the hammer we found that the close grained and very hard mass was quite fresh just below the surface, and it was evident that the fragments were protected from decay solely by the dryness of the climate. Our reindeer were now climbing like goats, and drew our light narts nearly to the point, where we halted after a run of two hours.

However the Obdorsk range of mountains may seem to differ essentially from the Uralian chain in striking towards N. 35° E. yet, in geognostical conditions, it exhibits a remarkable agreement with it. The syenitic green-stone which here formed, in large and independent masses, the outer ledge of the moun-

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tain, had been seen by us under similar circumstances from Yekatarinburg to Bogoslovsk. Towards the middle of the mountain, this was succeeded by hornblend-slate containing abundance of feldspath, in which very fine crystals of both the constituent minerals formed parallel and simple layers, while brown garnets were irregularly scattered through the slate. Masses of granular feldspath, only an inch thick, here traversed the strata completely, but invariably grew thicker the further they were traced. At the same time, a dark-green chlorite frequently took the place of the hornblend. Then the colour of the rocks grew brighter, and quartz became discernible as an ingredient in the mass; until at last, on the highest point of the pass, and on the lateral mountains, a yellowish and finely laminated gneiss was seen exclusively. Here the hornblend gave way decidedly to talc, and the white veins of granular feldspath were in general about twenty feet wide, and lay for the most part in the direction of the strata. These contained no talc whatever, and were traversed by quartz only in lines. The rock was a true beresite, and differed from that of the Ural only in having undergone less change from exposure to the weather. The metallic richness of the Ural may be expected with certainty from the Obdorsk mountains. The Titanian iron in the quartz-veins of the syenitic greenstone indicate platinum, and further researches in the veins of beresite will doubtless bring to light the brown iron-stone containing gold.

Wherever the rocky floor was weather-worn in the glens, we still saw single larches growing, to the height of 600 feet above the spot in the valley of the Khanami where we had seen the first rocks. At last, even the thickest stems were very low, but they were always straight, and never, like the pine tree on our mountains, bent into knee timber. To the same

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elevation, along the sheltered gorges, rises an alder, of about a man's height, on which there was nothing now to be seen except the red bark of the twigs, and the female flowers. It was only in these narrow hollows of the mountain that we saw snow sometimes a foot deep; and our companions said that in summer it remained only in these places and not upon the open slopes and summits. In that season the Samoyedes frequent these glens with their herds; and even now we could perceive many traces of wild reindeer, and we met with a trap made for the wolves that pursue them. This was a chest concealed under stones, over which was set a sliding board, loaded with large pieces of rock.

Higher up the mountains the surface of the sloping rocks was quite naked, and it was only on their eastern borders that the snow had accumulated into little hillocks; yet, even there it was altogether so scanty, that the long beards of the reindeer moss often projected from it. The violent gales from the north-west, which blow across these mountains during the winter, do not suffice to explain the remarkable deficiency of snow; but the deficiency in question, is itself a direct proof of the dryness of the upper strata of the atmosphere in this climate. The region of the lower clouds, too, lies at a much greater height, on the northern Ural, and the mountains of Obdorsk, than in the north of Europe, for of several summits, above 4000 feet high, not one reached the clouds.

It was curious to observe, how the perpendicular surface of the heaps of snow behind the rocks had become changed, in every instance, into hard, smooth ice, for this could have been effected only by its melting. The sunbeams, which played horizontally over the plain, fell perpendicularly on these walls of snow; and however their operation may have been weakened by their passing through the densest strata

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of the air, they seem nevertheless to have melted the surface of the snow, while the atmosphere, too, was at the temperature of — 28° R.

Very steep summits, perfectly free from snow, towered above us to the right and left, as we stood on the pass which leads westwards. The highest point of the group of mountains, which we originally named *the first*, lay to the left of our path, but was not visible from the point at which we had stopped, for it was concealed by nearer summits; and it was not till the mountain was descended half-way that we could see new and more distant mountains rising above these. It was now blowing with great violence from the west, and the Samoyedes dissuaded us, in a very earnest and pressing manner, from advancing further. The reindeer had been left a little way down, and we had to fetch wood from the sledge to kindle a fire, in order to observe the temperature of the boiling point. We found it to be 1°·49 R. lower than at our last encampment, and we had attained an elevation of 1660 feet above the point on the Khanami where the rocks first make their appearance.

Towards the east we could now descry, over a broad wall of outlying hills, the undulating plain through which the Khanami takes its winding course. The sun was already set, but the strong twilight still tinged with red the western sky and the snowy plain, and only the hollows lay in shade. The air was perfectly transparent, and there was not the least sign of mist in the valleys. Bright green shadows on the ground, from objects near us, could now be seen from the twilight, though less vividly than on our ascent, when the sun was darting its rays horizontally, and they added not a little to the charms of this singular landscape.

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CHAP. IV.

DESCENT TO THE PLAIN. — WANDERERS MET WITH. — A FEAST. — UNSUCCESSFUL ATTEMPT TO MEASURE A BASE LINE. — RETURN TO OBDORSK. — HAUNTS OF THE SAMOYEDES. — THE PESHCHORI. — THE ARIMASPS OF THE GREEKS. — THE FABLE OF THE GRIFONS EXPLAINED. — RETURN TO BERESOV. — COLOUR OF THE DEER. — NAVIGATION OF THE RIVER KONDA. — EFFECT OF RUSSIAN INDUSTRY ON THE NATIVES. — M. KARNILOF'S SCHEME. — NAVIGATION BY SEA FROM OBDORSK. — FEMALE POSTILLIONS. — RETURN TO TOBOLSK.

Our attendants were overjoyed at the successful termination of our excursion, and in descending the mountain they drove the reindeer at full gallop. The moon shone bright as we reached the pretty vale of the Khanami; we then continued our course till we came into the alluvial plain, where we met with two long caravans of wandering Samoyedes. They were going, as usual, at a very moderate pace, and only the younger of the free reindeer were trotting, like dogs, at the sides of the narts in which their dams were yoked. In these travellers we recognised the families which we had left in the morning on the Khanami, and we learned that they found their herds in better plight than they had expected, for the wolves had killed only two deer, but the rest were dispersed by the nocturnal attack, and had come together again in the course of the day. These people were wealthier than our party, and, besides giving our driver, either as a present, or for payment at some future time, a reindeer calf of this year, set before them a meal, which was extremely welcome after their toilsome journey.

We found the place where we had left our friends with the tent in the morning, now desolate and de-

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serted, and it was not till we had gone two versts to the north-east, upon a rising ground, that we saw the wished for chùm, and were soon after hailed with welcome greetings by our acquaintances. They had found in the morning that the plain where they had encamped was exhausted, as the herd had gone to a great distance in the night.

And now again began the attractive scenes of life in the tent. It is the custom of the Samoyedes, to heap up in the tent the whole stock of food belonging to its inhabitants, on the floor opposite to the doorway; and this part of the dwelling, which they call *sinikui*, is then regarded with a kind of religious punctiliousness, for the women, who, when busy about domestic affairs in the tent, make no difficulty in walking over the sitting or sleeping places of the others, will never tread casually within the precincts of the sinikui. On my arrival, too, I was asked for my stock of tea, and other articles of food, which were laid by in the general depository till wanted for use.

The reindeer calf which we had got on the way was killed and cut up in front of the tent, a few minutes after our arrival. The men now brought the bleeding and reeking flesh into the tent, and began devouring it immediately, quite raw, with the heartiest appetite. The old man was satisfied with sucking the brain from the head, while each of our younger comrades gnawed away a limb of the animal, even to the bone. They laughed at the amazement which my good-humoured Esthonian attendant expressed at their blood-stained faces; and when he gave them to understand, through the interpreter, that they were no better than wolves, they seemed quite unprepared for such a reproof; and replied, gravely, that they were at the same time no worse than the wolves, since they shared honestly with them, and left the

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bones and some scraps of flesh merely for their sakes. Rousseau's notion that repugnance to bleeding food is instinctive to man, was here disproved; but, on the other hand, his opinion respecting the superiority of education by mere example, without any ulterior view, was fully confirmed, for the little boy in our party, who was named Peina, afforded us new proofs of early development. He also got his share of the raw meat, and he had good teeth too, yet that did not prevent his importuning his mother immediately after to suckle him, as he did also every morning and evening as soon as the porridge was got ready for the rest. He then continued beating her till his desire was complied with, or till they gave him, instead of the breast, the pot-ladle, with which he helped himself to porridge, and contrived to eat it without burning himself.

The love of sugar grew on Peina gradually, as that of brandy on his parents, for when it was first presented to him he called it snow and threw it away, but afterwards he was sure to ask for it as soon as we produced our tea-things. Our bread, too, pleased him not a little, although it was now frozen hard, and not easily bitten, even by adult jaws. At night he was laid, naked, in a canoe-shaped basket, which we had already seen used for the same purpose in the Ostyak yurts, and he was covered up so thickly with furs that his cries at night seemed to come from the earth; but in the morning, again, his mother took him naked from his bed and left him to warm himself before the fire. When going on a journey, they wrapped him close in lined furs, and laid him before the door while they packed the tent. He then tumbled at every step in the deep snow, but never cried, for he knew from experience that he had no chance just then of engaging his parents' attention. When the sledges were all ready, his mother laid him again

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in his basket, and tied this on the nart in which she travelled.

On my arrival at this encampment, I had again ascertained the atmospheric pressure by observing the temperature of boiling water, and the result gave, for the mountain pass which we had reached, an elevation of 1500 feet above the ground on which we now stood; or, taking into account the rise of the ground from the banks of the Khanami, of 1660 feet from the base of the first greenstone rocks. Here, at the tent, and towards night, we found the humidity of the air somewhat nearer to the point of saturation, than it was on the mountain immediately after sunset; for, in order to produce dew here in the valley, it required to be cooled from — 27°·5 only down to — 32°·9 R., whereas, on the mountain, when the temperature of the air was — 25°·0 R., the dew point was — 31°·9 R. The effect of radiation, in each case, I observed with spirit thermometers, one of which had its surface gilt, while the other was covered with black wool. On the mountain, about one o'clock in the day, the blackened thermometer stood about 3°·0 R. lower than the gilt one, while here in the plain, about six in the evening, the difference between them was but 1°·5 R. This considerable reduction of the difference, however, is attributable only to the mist which began to form in the night, and not to the greater height of the first place of observation; for at Obdorsk, also, I have constantly observed that, though the sky was perfectly clear, the temperature of the blackened ball was 3° R. lower in the forenoon than that of the gilt.

December 14. — In order to deduce the height of the mountains here from the vertical angle observed at Obdorsk, it still remained to ascertain their distance from that point. The distance of 75·5 versts derived from azimuth-angles, and the consequent

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elevation of 4813 feet, were confirmed by the generally-received calculations of the people of Obdorsk, as well as by the time which we spent on the journey, going and returning, with the reindeer trotting at the ordinary pace. Yet it seemed desirable to measure a base here in the neighbourhood of the tent, and this would have afforded us a safer conclusion had not accident frustrated our labours. Two versts east of our tent there was a level spot perfectly free from wood, and from which, as the Samoyedes declared, the tops of the mountains were visible. We were obliged to rely for the present on their assertion, for during the night clouds had gathered in the sky, and a thick haze with snow, in fine uncrystallised flakes, cut off the prospect on all sides. I determined, therefore, to measure the base line to-day, and then to wait for clear weather in the company of the Samoyedes. After preparing stakes of larch-wood for stretching and directing the line, and to mark its extremities, I set the whole caravan in motion. On driving together the reindeer, it was found that eleven were missing; the people hoped, however, to find them next day, if the wolves did not devour them.

In spite of the very deep snow, the measuring-line was stretched on the chosen ground seventeen times, and the extremities of the verst, thus measured, was marked with stakes. While we were at work, however, our Samoyedes, with their tent and their reindeer, vanished completely, and there remained only the Ostyaks with three ill-equipped narts. Although this vexatious mistake might be chiefly ascribed to our interpreter's dislike of the nomadic life, which was daily growing more manifest, yet it seemed that there existed, in fact, strong objections to the longer continuance of reindeer owners in this place; for when, in the endeavour to attach ourselves to some

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other Saymoyed family, we proceeded to the place where some of those whom we met yesterday had spent the night, we found that they also had gone off; and our people insisted, that, owing to the fresh snow, it would be impossible to trace the wanderers, who had probably gone to a great distance, as the moss was all eaten and the wolves were prowling in the country round about. The truth of this last assertion was proved by what we saw on the snow-clad plain where we measured our base-line, for skeletons of reindeer lay there scattered about; some white, fresh, and scattered upon the snow, others gnawed away and nearly covered. We had often found antlers of reindeer, even on the mountains, but these were only what had been cast by the living animal.

Thus we were forced to put an end to our excursion, for it was agreed on all sides that Obdorsk was our only place of refuge; and here we arrived with ease and certainty, in spite of a heavy snow storm, after a five hours' trot of our reindeer.

The Samoyedes whom we had met with in the course of our journey, had all come from the coasts of the Polar Sea; and among the articles in their possession were to be seen many of the productions of that region. The traces of their reindeer, and many other of their leathern moveables, were made of dolphin-skin or furred seal-skin; and the mammoth-teeth, with which when carved they ornament their sledges and drinking vessels, are looked upon by all the indigenous tribes here as products of the sea coast: for they are more frequently thrown up by the waves wherever the sea breaks on slopes of alluvial land, and are consequently sought for by the Samoyedes chiefly in those situations. These families named their proper home Arkaya, that is, "The Great Land," or the tract which the Russians, from

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Samoyed information, designate as Bolshesémelskyi Béreg or the shore of the great land, and which extends from the mouth of the Pechora to the Obi.

This part of the country of the Samoyedes remained unvisited by strangers till the last century, while the western districts of Timansk and Kaminsk were frequented by the Slavonian merchants of the republic of Novgorod even before Rurik's time; indeed some strangers—that is to say, people not Samoyedes—had settled there before those earliest Russians; for the Samoyedes of that day related to the traders of Novgorod, that men of unknown origin were living in the midst of the high mountains which rise in insulated groups in the district of Timansk, and that some had ventured to approach the narrow openings into their subterranean dwellings and had heard them speaking an unintelligible language. In later times, and even up to the beginning of the present century, both Russians and Samoyedes have found deserted caverns of this kind (called in Russian *peshchóri*) so frequently, that it has been conjectured, with much reason, that the name usually given to the river, both by Samoyedes and Russians, had its origin in this circumstance. The metal utensils and the fire-places in these caves, leave no doubt that they were inhabited in ancient times by itinerant metal finders, of whom similar traces are found further south, also in the Ural, in the country of the Voguls; and who at one time spread themselves over all parts of northern Asia with the same object, just as the famed Venetian adventurers went through the German mountains.

But it is manifest, also, that the Greek information respecting the gold-seeking Arimasps, whom the ancients unanimously assigned to the northern branches of the Ural, referred in reality to some of these temporary dwellers in the western part of the country

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of the Samoyedes; and well might they credit Aristeas of Proconesus when he related that, on a journey in the north-east of Europe, he collected those accounts from the furthest of the hunting tribes which he had reached. The obscurest portion of his narrative, in which he tells us that the Arimasps seeking metals in the extreme north of Europe "drew forth the gold from under the Grifons," will be found to be at this moment literally true in one sense, if we only bear in mind the zoologically erroneous language used by all the inhabitants of the Siberian tundras. By comparing numbers of the bones of antediluvian pachyderms, which are thrown up in such quantities on the shores of the Polar Sea, all these people have got so distinct a notion of a colossal bird, that the compressed and sword-shaped horns, for example, of the *Rhinoceros teichorinus*, are never called, even among the Russian promuishleniks and merchants, by any other name than that of "birds' claws." The indigenous tribes, however, and the Yukagirs in particular, go much further, for they conceive that they find the head of this mysterious bird, in the peculiarly vaulted cranium of the same rhinoceros; its quills in the leg-bones of other pachyderms, of which they usually make their quivers; but as to the bird itself, they plainly state that their forefathers saw it and fought wondrous battles with it: just as the mountain Samoyedes preserve to this day the tradition, that the mammoth still haunts the sea shore, dwelling in the recesses of the mountain and feeding on the dead.

Now, if it be not denied that this northern tradition presents to us the prototype of the Greek story of the Grifons, while it suggests perhaps the intimate connection of both with the Arab fable of the Roc, then it must be allowed to be strictly true that the metal-finders of the northern Ural drew the gold from

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under the Grifons; for gold-sand lying under the formations of earth and peat, which are filled with these fossil remains, is at the present day a very common phenomenon. Although the statement added by Herodotus, that the Arimasps have but one eye, has never been explained, much less substantiated, by the conjectures to which it has given rise, and is therefore looked upon as either a misconception or a mere embellishment, yet, on the other hand, there is indubitable proof, in the later writers of antiquity, that they began already to perceive the true meaning of these statements, for they expressly tell us that the Arimasps gathered gold at a river.

With deep grief this evening I saw an end to my travels among the Samoyedes, and I felt inclined to envy the traveller of Proconesus, who amused himself for seven years with the northern Scythians or Nomades. But in our case, as in that of Aristeas, as Herodotus tells the story, nothing but pretended death could have baffled the inquiries of friends. For the people of Obdorsk were already anxious and alarmed lest snow storms might detain us helpless in the mountains. My wish to reach Kamchatka next summer did not allow me to remain here with the Russians, to witness the various concourse and traffic of the fair, to which there were numerous trains of nomades with reindeer already arriving. The next morning we prepared for our return southwards, and our friendly host was obliged to get ready for us in the greatest haste some *Pirogues* for the journey, which is done by splitting fish in halves and baking them in dough.

December 15—18.—We left Obdorsk, on the 15th of December, at 3h. 30m. in the afternoon, and did not reach Beresov till the 18th at noon, for some hours were lost in gathering the herds at each of the seven stages at which we changed deer. We were

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greeted by the Ostyaks every where as old acquaintances, and received from the richer of them the presents prescribed by their hospitable customs. Our route went at first south-westwards at a distance from the river. The sky was darkened with clouds, and the snow fell thick, so that even our experienced guide was not always sure of his way in this uniform wilderness; and we had gone astray several times before we reached the yurts of Sobi and their bearded chief. From thence we proceeded, during the night, to Vandiaski Gorodok; and the next day, with clear weather, we passed through Shurushkar and Mushi. Now, as we were travelling in an opposite direction, the reappearance of a more vigorous vegetation made a stronger impression on us than its disappearance had previously done. For example, in the latitude of Obdorsk, and beyond the polar circle, on the way to the mountains, we had totally lost sight of the birch (*B. alba*), but now on our return it first showed itself, and was a striking object between Vandiask and Shurushkar, in lat. 66°·2 N. The pine woods did not begin to thicken for some distance further on, but 150 versts north of Beresov they already exhibited great beauty and variety.

In that place we sought in vain, on the 17th, the tents of Keegatsk; but ten versts from the spot where they had stood, and nearer to the river, we found in the wood a permanent winter-dwelling, in which we had to wait five hours for the reindeer. Here, on our return, they showed us, for the first time, a tool used by the Nisovian Ostyaks for their more elaborate carvings in wood and horn. It was an iron point, fixed in the narrow end of a conical-shaped piece of wood, and was turned like a European drill, by means of an elastic bow, the string of which embraced the wooden cylinder. The awl or borer itself was smooth

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enough, and the point well hardened. This tool is made by Samoyedes, from Russian iron probably, and is sold to the neighbouring Ostyaks.

At the yurts of Teginsk we now parted from the reindeer also, for only three teams went on with us to Beresov; but it was here that we saw, for the last time, the pretty herd collecting, and listened in the darkness of the night to the driver's cry, the remarkably exciting sounds of which we had so often heard ring through the leafless woods. During the last few days we had been surprised to see perfectly white and speckless reindeer, in the same team with others of a dark brown colour, and were sometimes disposed to look upon that colour as a morbid albinism; but the distinguishing mark of albinos among other animals — the faint colour of the eyeball — was in this case wanting. But the bright grey hairy skin which covered their horns, seemed more enduring in the white individuals than in the brown; for it remained quite uninjured on the horns of the former, while it hung down in shreds from those of the latter. The Ostyaks had in most cases cut off, for domestic purposes, not only the smaller branches of their reindeer's antlers, but the greater also, about an inch above the root, and the surfaces of the stumps were then covered with a thick coat of frozen blood; in other respects they treat these animals with remarkable forbearance. They generally use their driving staves with great caution, and only once I saw a driver hurt a deer between the thighs with the knob at the end of his staff, to the great annoyance of his comrade. The Ostyaks, when travelling fast, are careful to watch when the animals' flanks begin to beat violently, and then they halt immediately to let them take breath. At times, after a smart run, their hard breathing was accompanied by an audible rattle in the throat, but this was always remedied by

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loosening the throat-band of the bridle. The rutting season of the tame deer here falls as that of the wild in September; they cast their fawns in the first week in May, and the young ones are not yoked in harness till their second year. If they escape accidents, they reach the age of twenty years.

December 19.—The vapour-baths in Beresov made me enjoy, not a little, the return to Russian manners. We then went to call upon our former acquaintances, and found, unexpectedly, some new and very important visitors in the place; for three government officers were now engaged in making a census of the indigenous population, as had been done fifty years before, for the purpose of assessing anew the yasak or fur-tribute. They had gone in the summer up the Konda, which enters the Irtuish on the left bank, about twenty-eight versts below Repólovo. This is a full stream, and might be easily navigated by the craft on the Obi, but such an attempt has never yet been made. The people dwelling on the banks of this river were found to be in extremely flourishing circumstances. They are Voguls like those of Bogoslovsk, and it is not surprising, therefore, that great differences should have been remarked between their dialect and that of the Verkhovian Ostyaks. We have already seen what the fishermen at Repólovo borrow from these neighbours.

The yurts of the people dwelling on the Konda, are longer and more perfectly arranged than those of the Ostyaks on the Obi; and, besides the chubal or stove, there is to be seen in them, invariably, the boiler built into the wall, which is found only in some of the Verkhovian dwellings, but always in the houses of the Tatars of Tobolsk. In this the Voguls boil the barley porridge, which constitutes their chief food. The people of this tract, both men and women, are described as strong and healthy, but it is erroneous to

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suppose that they must be distinguished on that account from the Ostyak race, for every where below Beresov we found the latter also exhibiting all the signs of vigour; and in remembering what we had seen previously among the Verkhovian Ostyaks, we must at the same time attend to the fact, that the further we went southwards along the river, the more we found the people pining with famine, and on that very account disposed to suffer from miasmata. In the Verkhovian hamlets, the number of those liable to pay the yasak, is found in many cases to have diminished to the extent of seven-eighths within fifty years!! This loss, however, does not all arise from death, but many of the unbaptized have withdrawn from the river at various times, to the woods and tundras of the north.

It is Russian civilisation which has reduced to misery the fish-eating tribes of the Irtuish and Obi; and this, without the intention of so doing, and in a way not liable to censure: for, to most people, it will seem an advantage that the fish of these rivers should be taken at particular places, in larger quantities at a time, in a manner open to the inquiries of the statist, and that single families should be able to make large fortunes by the fisheries, while enough still remains to the original inhabitants to enable them to live with little care. But it must undoubtedly be here expected, as a consequence of European industry, that the remarkable migrations of the fish up the fresh waters, will hereafter be known only from traditions of the past; for all over the earth, from the equator to beyond the polar circle, there is hardly the mouth of a river, which was not at some early period frequented by those inhabitants of the sea, as regularly as they now visit all the rivers of Siberia, Kamchatka and of the American coasts, occupied by the indigenous tribes: and the migration in question is,

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assuredly, one of the phenomena which man has it in his power to eradicate completely from the face of the earth. Should such results be approaching here, yet it is not likely that they will have what can be called a decisive effect on the human race, for the Ostyaks must all perish before that critical period arrives, but the Russians surviving them will betake themselves to new branches of industry when the fisheries once fail.

The Russian townspeople and traders, who, from Tobolsk and Beresov, as well as from the villages, annually fit out great fishing expeditions, are here named *pràsoli* or salters (from soliti, to salt), because they were the first to turn to account the rich salt deposits of the Siberian steppes, in preserving the fish of the Obi. Undertakers of this kind form themselves into an artéli, or association, which will sometimes expend 20,000 roobles during the summer in equipping vessels with men and provisions, and with nets eight hundred feet long, and strong enough to hold twelve poods (480 lbs.) of fish. They then settle themselves in the neighbourhood of the sand-banks, which have been found most productive, and which they have purchased or hired of the Ostyak inhabitants. There they spend the summer in praiseworthy activity. The fish are salted as soon as they are caught, and packed in tubs, containing 800 or 1000 muksums, and as many as 2500 of the smaller kinds of salmon. It is true, that some of these Russian associations have recently realised profit to the amount of 150,000 roobles in one summer; but it is at the same time equally certain, that the fisheries of the Ostyaks round about were thereby seriously damaged.

The Russian official agents, to whom the superintendence of this country has been confided, have been always perplexed by the difficulty of reconciling

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the conflicting interests in this case; but never was so rare and felicitous an expedient for the welfare of the land thought of, or explicitly enounced, as that contained in the still unexecuted scheme of M. Karnílof; who proposed at one time, to the government at St. Petersburgh, that it should take into its immediate possession all the valuable fisheries on the Obi and lease them only to Russians, for "Then," he observes, "the harmless and amiable Ostyaks, to whom the sandbanks belong by inheritance, would at once, and for ever, be relieved from the anxiety of retaining possession of them, and nothing more would be heard of their troublesome complaints of local injuries done to them. The fish-eating inhabitants might then learn to support themselves on the nuts of the Siberian pine, or by catching birds and quadrupeds; so engaged, they would not be troubled with competitors, and might enjoy tranquillity of mind." It was proposed, at the same time, that a commercial intercourse should be opened between the most northern district and European Russia, by means Utopian enough to match with the proposal just stated, — namely, by a water communication between the Obi and the Pechora, whereby the prosperity of Beresov would be insured.

The river Sobi, which flows into the Obi 100 versts above Obdorsk, has its sources in the western mountains, at the south of the five groups (p. 63.); where we saw from a distance that chain terminate abruptly, and where, at a broad pass, the line of strike of the Uralian mountains ceases, and that of the Obdorsk range begins. From the sides of the two diverging mountain systems, the waters meet together in a flat tundra (or mossy waste), which feeds not only the Sobi but also the Usa, which flows westwards into the Pechora. It is said, that in the summer of 1807 the possibility of realising the conditions required for

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the proposed navigation, was actually examined on the spot. M. Karnilof went with a vessel from Tobolsk to the mouth of the Sobi, and there he remained, without leaving the Obi, while he sent to the mountains, by the way of Beresov, a surveyor and six Kosaks, to the sources of the rivers, to examine the falls of the Sobi, and to leave a signal for Lieut. Colonel Popóf, who was to ascend the Usa from Europe. The result of these researches has never been made public; M. Karnilof himself said nothing upon the subject, though, some twenty years later, in the work already referred to, he took for granted the possibility of the navigation in question: but here in Beresov, M. Nijegorodzov remembered to have been informed by the surveyor employed on that occasion, that the salmon ascending the Asiatic and European rivers respectively, do, in fact, meet in the waters of the morass, but that boatmen from the Obi and the Pechora could not follow the example of the salmon without the help of six locks in the Sobi, and perhaps as many more in the Usa. It is not likely, therefore, that this mode of communication will ever supersede the much easier sea-voyage from Archangel to Obdorsk; for even if the river-navigation were to succeed, still the passage from St. Petersburg to the Pechora would be always made by sea: but the facility of navigating the Polar Sea from Europe to Obdorsk, has been proved by some Kosaks of Obdorsk, among others, who in 1730 went in a lóda or long boat down the Obi, and then by sea to the convent of Solovetsk 4°·5 west of Archangel; and this they did only as an exercise of piety. In conclusion, it cannot be denied that it is of the greatest importance to facilitate the communication, whether by sea or otherwise, between the circle of Beresov and Europe, for mast timber of the greatest beauty is here in extreme abundance; and further north the

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mineral wealth of the mountains of Obdorsk would contribute to repay the cost of obtaining that object.

December 20—27. We left Beresov at noon with a clear sky, and the thermometer at —25° R. When the sun was about two degrees and a half above the horizon, the phenomenon of the *Stolbui* or pillars was again visible, extremely bright, and well developed. The prismatically coloured bands of light at each side of the luminous body reached perpendicularly down to the horizon; but above, they did not rise on this occasion quite to the height of the sun, but terminated somewhat lower, and at the upper limit of a white frosty haze, which lay like a cloud on the sky for some distance along the horizon. The red predominated among the prismatic colours, and appeared with a bright and dazzling lustre just at the limits of the white haze against the blue sky. I saw no trace to-day of the continuation of the luminous arches on the ground (see p. 20.), nor of icy spiculæ floating in the air, for my eye was not now, as it was at that time, surrounded by the frozen haze; but this appeared to form an insulated mass at a distance from us in the south, its upper limits being less elevated than the sun.

On the 21st and 22d we found the wealthy Russians in Shorkal and Yelisarovo looking exceedingly emaciated, for they were adhering strictly to the forty days fast, which lasts till Christmas; and they could now make themselves some amends only by eating the most delicate and highly prized kinds of fish. The traders of Samárovo seemed to be less scrupulous, for on the evening of the 23d they welcomed us, like their friends at Beresov, with European wine. And here indeed was exhibited, in a greater degree even than in Beresov, the confused destination of the apartments, in which were blended the characters of the dwelling and the warehouse;

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for Samárovo is a middle station for the trade where the younger and travelling traders carry on a temporary barter only, in the hunting season. They were at present rich in the produce of the south, for they were just come from Tobolsk.

The settled Ostyak fishermen on the Irtuish, with whom we now renewed our acquaintance, from Samárovo to Denjikóvo, asked us many questions respecting the condition of their northern fellow-countrymen; and with ready ear and full hearts, they heard the praises of the land in which one could still wander, as heretofore, with rein-deer, and where was an abundance of soft furs for bed and clothing. And even here they talked very seriously of a lost paradise; but it has been transferred to the north and beyond the polar circle. The more commodious houses, constructed in the Russian manner, which meet the eye in the last of the Ostyak villages, are but deceitful signs therefore of progress towards happiness.

South of the sixtieth degree of latitude no pure Ostyak families are to be met with, for these have never attached themselves to agriculture, which, from that limit to Tobolsk, is carried on regularly around Russian villages. On the morning of the 26th we witnessed anew the fairest fruits of this industry, in the town of Demyansk; the large and opulent houses of which, and the vigorous population, worthily maintain its established character. Then follow little villages to Terekhina, where we witnessed a rare example of the imperturbable resoluteness of the Russian people. In the hut in which we were to get our horses we found, late in the evening, only women and girls gathered around the burning lath which gave them light. They were singing, and spinning the unbleached wool, from which is made the karaseja or brown web for peasants' clothing. From time to time they bewailed their hard fate, for a

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short time before, a military conscription, extending to this place, had carried off all the young and active men of the family; whether old men remained, and were now only absent on business I did not learn, but this I know, that in a most severe snow storm four young girls mounted the horses of our sledges, and then, timidly at first, but afterwards boldly and with the usual cheering cries, carried us a distance of thirty versts in full gallop.

On the morning of the 27th we were again surprised at seeing, beyond these Russian villages, in the vicinity of Tobolsk, and close to the steep bank of the Irtuish, sooty and squalid yurts. We entered them, and immediately knew the occupants to be Tatars, as well from the shaven crowns of the men, as from the handsome brunette visages of both sexes. This was the place called Philátefsk, which we saw at our departure, only in the evening and from a distance. The Ostyak mode of living cannot be confounded with that of these people, yet the yurts of both are shaped alike; but those of the Tatars have always the advantage in cleanliness, and, besides the chubal of beaten clay, there is also the well-set boiler: in the recesses, too, instead of skins there lies usually some woven fabric, sometimes cushions of Russian cloth, sometimes Bucharian carpets, and, with the poorest, at least coverlets of hairy felt. The men and women were now sitting, with their legs crossed under them, squeezed together round a tall vessel in which the brick tea was prepared; there was at the same time a strong odour of fat from the horseflesh in the great pot. It is only on the wildest spots of the thickly wooded banks of the river that these descendants of the former rulers of the country are still to be seen on the northern side of Tobolsk; but being rich in horses and familiar with the lan-

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guage of the south, they have a peculiar aptitude, fortified by old habits, for long trading journeys.

After travelling for thirty-five days we again reached Tobolsk on the evening of the 27th December. The nomade life of the north had vanished like a fugitive dream. It was still, however, too fresh in my mind, to cease to awaken longings which here, in the town, only grew more irksome. In fact, it was from subsequent journeys and new scenes, that I first learned to perceive that what has gone by has been enjoyed.

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CHAP. V.

MIDWINTER IN TOBOLSK. — PARHELIA. — PREPARATIONS FOR DEPARTURE. — MISHAPS. — TATAR YURTS. — THE ISHIM. — SNOW HURRICANE. — INTENSE COLD. — CHRISTMAS FESTIVITIES. — ARTICLES STOLEN. — EFFORTS TO RECOVER THEM. — CEREMONY OF EXPURGATION. — FORTUNE-TELLING PARTIES. — EASTERN ORIGIN OF THESE CUSTOMS. — MASKS. — STEPPES OF BARABÀ. — GNATS AND OTHER PLAGUES. — KAINSK. — MINSK. — THE DOGS OF THE STEPPE. — HONEY TRADE. — KOLIVAN. — GRANITE AT OYASK.

I PASSED the last days of the year in Tobolsk, where, even at that season, the external world was not without its charms. All the open places in the city were covered with a carpet of snow of inconceivable brilliancy, further heightened by the transparency of the deep blue sky. It was only during the early part of the day that any mist prevailed; which had rather the property of reflecting the sun's rays from its frozen spiculæ, than of dimming their light. Two ruddy parhelia, of an elongated shape, were frequently observed to rear themselves to the same altitude with the sun, the dull column of light, which extended downwards towards the horizon, often taking an irregular and oblique direction, like falling showers when hurried along by the wind. The temperature of this year was altogether consistent with the popular persuasion, that the Christmas frosts (those that set in about the 6th January) are always the severest of the year; as is expressed, by the Siberians, in an adage equivalent to our own, "When the day lengthens the cold strengthens." This seemed only to serve as an incitement to the preparations for the Christmas festival. A long avenue was formed on the ice of the

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Irtuish in front of the principal houses, by clearing off the snow and enclosing it within a double row of green pine boughs, so as to form a course for the sledges.

It would have been impossible for me, however, to remain to enjoy these festivities without relinquishing more important concerns. Professor Hansteen and Lieutenant Due had already started for Tiukalinsk on the 13th of December, so I determined to take a northerly route by Tara and continue my magnetic observations in that direction. The snow presented great facilities for rapid transit from station to station, and the construction of a new sledge, like that described above (Vol. I. p. 397.), which was kindly undertaken by friends at Tobolsk, had in view this end alone. It had been reduced accordingly so much below the ordinary size, that the whole interior was barely sufficient for my instruments and baggage, so that the accommodation for myself and attendant completely overhung the sides.

January 4, 1829.—It was about four o'clock in the afternoon that we took our departure from this city, following the right bank of the Irtuish as far as the village of Bakcheyeva, where we crossed the ice to the left bank. So little is known, even here, of the Ostyaks or their peculiar habits, that the dress of rein-deer skins, which I had worn ever since my visit to Obdorsk, was an object of curiosity to the inhabitants of the village. A disbanded soldier, however, from Kamchatka, remarked its resemblance to those worn by the people of that peninsula.

Southward of the Irtuish the land became hilly and deeply intersected with water-courses. A Tatar churchyard on our right attracted our attention, with its picturesque groups of closely-planted birch.

The inconvenient construction of our carriages now became apparent. We had been repeatedly

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thrown over the sides by the heavy jolting of the vehicle upon the uneven roads, till we at last suffered a complete upset, at a sharp turn, by the breaking of our side bars, which gave way from the centre of gravity being placed too high. By this mishap I lost the handsome bows which I had procured from the Ostyaks. They had been tied at the back of the sledge, but projected so much over either side that they broke in splinters as soon as their ends touched the ground.

Under these disadvantages the continuance of our journey would have been nearly impossible, but for the effectual assistance we received at Staroi Pogost, where we had another instance of the cheapness of the native produce of Siberia. At the suggestion of a Russian peasant I made a purchase of a low open sledge, sufficient to hold a great portion of my baggage, along with my servant, for the moderate price of two roobles and a half, or about two shillings sterling. These vehicles, which are universally employed in winter-journeys throughout all parts of Siberia where horses are found, are precisely similar in shape to those described by Herberstein and Meierberg, in the sixteenth century, as in common use in the vicinity of Moscow.

January 5.—The night was passed in repairing our old carriage and arranging the new one, so that we did not set out till five o'clock in the morning, and by six in the evening we had reached Istyatskiya Yurtui, ninety versts from Staroi Pogost; after passing through a rugged tract of country overgrown with fir, pine, poplar, and birch, and frequently interrupted by rivulets, which are crossed on high-railed wooden bridges. The villages of Kopotílovo and Dresvyanka are inhabited by Russians, who live by letting out carriages and horses, and who were, as usual, very urgent in their offers of service to us.

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Istyatskiya Yurtui, or Istyatskaya Stantsia, is a Tatar settlement. In their construction and internal economy the yurts bear a close resemblance to those of the Verkhovian Ostyaks: here, too, there is always found a cauldron built into the wall, independent of the chubal or stove by which their apartments are warmed; but instead of the separate berths or enclosed sleeping-places of the Ostyaks, these yurts have merely a long narrow ledge against the wall, covered with rugs, felt, cloth, and skins. In one of the huts which I visited they were just shaving the head of a boy of about eight years old, upon whom this operation had been evidently practised before, from the regularity and shortness of the hair which remained. The instrument employed was not a razor, but the blade of a common knife, with which the operation was performed by an old Tatar with great rapidity and neatness. We changed horses twice again — in Balakhláisk Yurtui and Kuseryatzk; and on

January 6. — Entered the Russian village of Chistyakòvo just after midnight. We unexpectedly found the villagers still up, and were immediately ushered into a court-yard of one of the houses, which is here as well as in European Russia, enclosed with a wooden fence. We felt cheered by the gleam of the fire from the ample stove of the isba which shone through the windows, and discovered a number of women busied with soup-kettles and flesh-pots, in preparation for the feast of the following day. Notwithstanding all these seducing appeals to our appetites, we were obliged to push out again into the dark and cold waste of snow, conducted by the inmates of the house, carrying long torches of pine. We had the good fortune to find our horses here, and at the following station, so full of spirit that they had to be held by two men till the court-yard gates were open, when they started at such a rate that we were

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obliged to hold them in, even on the heaviest part of the road.

Our next stage was Vikolovo, on the hilly bank of the Ishim: we reached it towards nightfall. The bells were ringing for early mass, and in one of the houses of the village a number of boys were singing a hymn, in which "Christos rodilsya" (Christ is born) was sufficiently indicative of the event intended to be commemorated. These singers are rewarded with refreshments at every house. Here, too, we found the same preparations going on for a feast; which was not to be touched, however, till after sunrise and the hearing of mass.

We crossed the Ishim just beyond Vikolovo, where it runs in a deep chasm and far below the level of the bridge, even after the snow has began to melt. The Russian peasants take squirrels, ermines, and foxes in the adjacent woods, which they complain afford a less plentiful supply of these animals now than formerly.

At Kotochíkovo, twenty-one versts from Vikolovo, I observed just before mid-day the magnetic intensity and the dip of the needle. The sky was perfectly cloudless, when suddenly a violent squall assailed us from the northward, now sweeping the scanty, yet hard-frozen and prickling snow, right onward in a cutting blast, and again carrying it upwards in eddying columns like a whirlwind. These gusts are of frequent and sudden occurrence on these points of the snowy waste, when the cold falls below the usual average of the season. They are known throughout all the northern parts of Asia under the name of buranui, and are looked upon with great dread by the Kamchadales and tribes on the borders of the Icy Ocean, where the snow-drift is so dense as to obstruct the view of the traveller completely, and to preclude all chance of his recovering his track. The violence of

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the commotion, however, soon restores the equilibrium of the atmosphere. In the present case we were scarcely detained an hour, which we passed in a peasant's cottage. The family were gone to mass, and left no one at home but an old woman, who kept incessantly bowing and crossing herself before an image in the corner of the apartment, and ejaculating her prayers in a monotonous whine, totally unconscious, as it would seem, of our presence.

At seven in the evening I proceeded to make an astronomical observation, at a thriving village called Ayevskyi Volok, where the cold was so intense that I lost the skin of one of my fingers by touching a screw of my instrument with the naked hand. This may generally be guarded against by wearing a thin glove under the heavy inflexible mittens of the malitza, so as to protect the fingers whenever they are thrust out through the slit in the cuff.

We laid ourselves down us usual upon the palata in the house of the chief man of the place, where we not only got comfortably warmed, but were regaled with their best fare and some excellent kvas. The Siberian peasant is seldom without a store of nutritive, and even delicate food, especially at the season when flesh is permitted to be eaten. Their usual vegetable pottage is then rendered more savoury by slices of meat, and they likewise indulge themselves with *studen* or a sort of jelly, which is eaten cold with vinegar and mustard, and is a preparation of the gristle and softer bones* of the animals killed for food. On festive occasions the peasants bake wheaten bread, and convert their flour into pastry and cakes of many sorts.

The cold during the night seemed to make its im-

* Babkui, or vertebræ, which are afterwards used as a sort of skittles, in a well-known national game.

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pression even upon our hardy drivers; so that we stopped awhile to warm ourselves at Verkhovskyi Volok. We found there two podryadchiks or speculators (literally undertakers or contractors) from Tara, who had come to buy up bread in this district; which, as it lies higher than the plains adjoining it on the eastward, is, consequently, in possession of a drier soil, and better calculated for the cultivation of corn.

January 7.—The surface of the country had now become more level, and thickets of willows, and similar indications of an approach to a swampy country, more frequent. We learned at Ruibinskaya Volost, where we halted about noon, that the peasantry had already begun the celebration of the festival, according to established custom, with a drinking bout. We found a large number of jovial companions assembled in the isba of one of the houses, with a large tub of beer on the floor before them; which, upon such festive occasions, is brewed (or boiled as it is there termed) by some of the principal householders of the village. It was a dark, muddy, oily-looking liquor, well thickened with husks of barley, which seemed rather to recommend it to the more seasoned topers, who drank it to intoxication. Among the most boisterous in their merriment was an old woman, who gave us to understand that she was a convict. She kept up an incessant and animated descant upon the happier scenes she had witnessed at Moscow, calling it, as the whole of European Russia, occasionally, "her mother." "It was there that people had nothing to do but drink mead and brandy, and show their scorn of the miserable Siberians." She showed, however, no less relish for humble beer, and seldom let go her hold of the wooden mug, dancing and shouting all the time in the middle of the room.

We were presented with a similar scene at Savyálovo, seventy versts from Tara, which place we

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reached in the evening. Our sledges remained under the care of the seneschal of the village, while we paid a visit to the soirée (vecherok) which was held in a neighbouring dwelling. These meetings are always punctually attended by the fair sex from Christmas to Twelfth-day, under a superstitious expectation of learning their future fortune from certain omens. The maidens of Savyalovo were just in this state of anxious excitement when we presented ourselves, in our Ostyak fur-cloaks, to the consternation and dismay of the company, who were ranged on benches fixed to the walls of a dimly-lighted isbà.

January 8.—To-day at length we arrived at Tara, where we were immediately assigned a lodging for our stay in the town. Upon unpacking our baggage we discovered the loss of eight articles, which had been laid under the mattress or cushion of the larger of our sledges. Among other things, we missed a part of the stand for the magnetic instruments, as well as the compass used in taking the declination. This was a loss which it was absolutely impossible to repair. No more untoward accident could be imagined, nor one more inevitably fatal to the entire design of my journey. It was at Ayevskyi Volok, only 150 versts from Tara, that I had used the instruments last, and the body of the sledge seemed so perfectly secure that I felt convinced that a robbery had been committed. I accordingly waited upon the magistrate of the place, and expressed my determination to return forthwith to Ayevskyi Volok, and be present at an official investigation into our loss. A Kosak subaltern (uryadnik), of the name of Krepikof, was ordered to escort me, conveying a written injunction to the assessor of the communal court there, to proceed in instituting the most searching inquiries after the missing articles, along the entire road, if necessary, from Ayevskyi Volok to Tara. Thus within three hours of our

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arrival were we again retracing our route, after having committed the rest of our property to the friendly care of Doctor Roscher, to whom I had letters of recommendation from Tara.

The evening saw us again in Savyalovo, and as our unexpected return to so remote a place might excite suspicion of our purpose, our attendant resolved to have every house searched immediately by the seneschal. This step, however, was not attended with success; so that we pushed forward till

January 9. — when we re-entered Ruibinskaya Volost. The inhabitants of this village seemed totally clear of all participation in the theft, for our sledges had been drawn up, there, immediately under the windows of the apartment where we had lodged. My first step was to visit the clergyman of the place, where I was told that I should find M. B. the magistrate, whose support I might also engage. My interview was little calculated to give me much confidence in the co-operation of this personage. I did appear to succeed so far with him, certainly, as to make him comprehend the extent of our loss, and to learn from him, that as there was no money in question it was possible we might succeed in recovering our property. Though this expectation seemed to vanish gradually before the doses of brandy with which he fortified his alacrity, we nevertheless took our places in his sledge, leaving mine to the bailiff by whom he was attended. M. B. was of German extraction, an advantage of which he liked to boast when none of his Russian friends were present. It was to this descent, probably, that he was indebted for a certain winning *bonhomie* that he occasionally made available in coaxing the women of the poorer sort of villages through which we passed, to give him brandy. It was no less edifying to observe how useful his faded uniform was in blinding the simple

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minded boors to this little weakness of their official superior: an effect which was obviously much promoted by the sight of the large and full-toned bell that he bore on the harness of his sledge, like other personages of importance, while traders and ordinary travellers must be content with the small and common sort used by the post-masters. The postillions and horses, with which we were everywhere supplied, were so well calculated for our hurried journey, that we got back to Ayevskyi Volok at ten in the evening. It was with very altered feelings that I repaired to the house of the starost whom I had visited two days before. Here a general search was made without delay, and the yamshchik who had driven us to the next post station, and a peasant who had assisted in packing our instruments, were placed under surveillance. Singularly enough it turned out upon this occasion, that we were obliged to commit our prisoners to the care of one of the parties implicated in the theft; inasmuch as the suspected individuals were members of the household of the chief man of the village, who is always the head of the local police.

January 10.— This day was ushered in by the examination of whatever evidence could be collected, as to the supposed robbery, but without any other result than that it seemed satisfactorily ascertained that every one of the missing articles had been punctually replaced in the sledge on the 6th.

Nothing accordingly now remained to be done, as the judicial functionaries declared, but to have recourse to the kissing of the holy image, as is usual in such cases, and which has all the solemnity of a declaration upon oath. The judge of Verkhovskyi Volok, the next town on the road to Tara, was consequently summoned to our assistance that same evening, and the ceremonial was gone through in

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the presence of the entire population. An image was conveyed from the church, and being placed upon a table in the open court, the suspected parties were then introduced, one by one, and admonished by the president that none should presume to salute that image, to which all things would be revealed, unless they had truly and circumstantially answered all questions put by the judge, and were utterly unconscious of any participation in the crime of which they were suspected. No confession, however, ensued. Nor was I myself more successful in a public address, in which I promised a complete amnesty to the delinquents, provided our lost effects should be returned to our sledge, which was left for that purpose during the night in the open street.

January 11.—In this hopeless position of our affairs I could hardly persuade myself that it was not a dream, when I was visited by our kosak Krepikof at five o'clock in the morning, and awakened by his congratulations upon the recovery of every article that had been lost. With him came a yamshchik from Verkhovskyi Volok, who had driven the priest of that town hither the evening before. His account was, that he had, to his great astonishment, found the instruments spread out upon the snow at the entrance of the village, and that he had immediately taken measures to restore them to their owners. It was added, in explanation, that the person at whose house we had halted on the night between the 6th and 7th, was a malefactor lately banished, and a man of very bad reputation too; that he must have been the thief, and was no doubt terrified by the strictness of our search, into restitution of the property. It was certainly true that the sledge had been left unguarded during a dark night before this man's house; it likewise seemed reasonable to conclude that the articles had been abstracted in a very

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hurried manner, as one only of two boots that had been laid together, was missing; besides, that a large portion of the booty seized upon was evidently quite worthless to the thieves. Still there was much to be said upon the other side of the question: the snow had fallen heavily during the night, and, notwithstanding that the box containing the compass bore marks of having been forcibly opened, I perceived that it was nevertheless perfectly free from wet or any other damage. As the inquiry, however, had been attended with such brilliant success, I felt but little disposed to challenge the consistency of the story, and with a lightened heart set out upon my return to Tara, leaving, at the same time, according to custom, a commission with the minister of Verkhovskyi to present a taper of five roobles value at the shrine of St. George, whom I had chosen for my protector and patron during my stay in Russia.

January 12 and 13.—At ten in the morning of the 12th, we found ourselves once more in Tara, where I received the congratulations of all the town, nearly, on the fortunate termination of my recent adventure. Tara is situate upon a considerable height, one verst above the confluence of the Agarka with the Irtuish. The steepness of the declivity towards the water, and the deep chasms produced in it by the action of the frost and floods, give the entrance into the town a very picturesque character. The bridge, which was then under repair, is raised upon high piles in order to place it beyond the swelling of the river.

Upon the eve of the new year (12th January, New Style), I received an invitation to the house of the captain of the district, where table songs (*poblyudnie pesni*, literally, dish-songs), as they are called, and fortune-telling games, were entered upon, with all the earnestness of old times, by the ladies of Tara. All

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the young ladies, anxious to pry into their future destiny, place their rings in a covered dish, and then commence the song, which is composed in short strophes, each involving some mystic and prophetic allusion to marriage or to riches. Meanwhile the rings are drawn out of the dish separately, by some of the elder ladies, and so that the prophetic expressions of each strophe are made to apply to some of the individuals engaged in the game. I have little doubt that this custom is borrowed from the soothsayers of the Mongol and Manchoo tribes, among whom it is usual to place before the image of Buddha (as, for instance, in the Manchoo temples at Maimatchin) a basin containing written oracular sentences, portentous of good or evil fortune to the votaries who avail themselves of such intimations after prayer. The most conclusive evidence of this connection between the Buddhist ceremonial and the Russian incantations, seems to be offered by the following stanza in one of the songs,—"Guess, O maiden guess, in which hand is fate and the dragon's wing."

These words, it must be avowed, necessarily bring to mind the dragon which figures in the mythology of the Manchoos; the lo or loo of the Mongols; and the lung or lunn of the Chinese. The Mongols, for instance, represent the impersonation of their divinity with wings; and describe him as reposing in winter in the seven seas, and in summer mounting to the skies, controlling the seasons, and imparting life to all nature. Nothing, therefore, can be more natural, than to hear the dragon's wing introduced into Mongol poetry as the symbol of destiny. The adoption of a similar idea among the Russians, is not however attributable to the Siberians, for the dish-songs were familiar to the European part of the population long before the conquest of Siberia; the reasonable conclusion in this, as in other instances already

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alluded to, is the existence of some previous, though long-forgotten, intercourse between the Russians and Mongols. In point of fact, we know that the tribes under Chingis Khan, who overran that country, were really a branch of the Mongol nation from the government of Irkutsk, who subsequently formed a union with the Tatar hordes; and to the latter the Russian historians, in process of time, incorrectly attributed the whole glory of the conquest.

Several others of their divinatory practices still exist among ourselves; as, for example, where omens are drawn from the dripping of melted wax into water, and where the matrimonial prospects of the young women are foreboded by the manner in which little shells move, with regard to each other, on the surface of a vessel filled with water. In like manner, allusions are made in the ancient Russian bridal songs, to the rolling of rings or beads of pearl across a piece of velvet towards the expectant lover. Their peculiar superstition, however, is the importance attached to the *podslushivate* or listening; that is, the import of particular words caught up outside a window, from any conversation carried on within. The loneliness of the situation where this appeal to destiny is usually made, naturally exalts the inquirer's susceptibility of ominous impressions; for which reason the country girls generally station themselves in the bath-chamber about midnight, where they expect to enjoy an interview with the apparition of their destined husband. The bath is regarded by the ignorant as the favourite retreat of the household sprite. It is, at the same time, easy to conceive that the fair votaries may at times be favoured with meetings requiring no intervention of supernatural means or beings.

The following evening it fell to the lot of M. Philémonov, one of the principal merchants of Tara,

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to entertain his fellow townsmen. Here, again, the numerous guests were amused with playing at forfeits and with national dances, which were made rather to assume the character of plays from the songs with which they were accompanied. These amusements were further enlivened by the sudden appearance of masks among the visitors, which gave the festival very much the air of the Carnival, as it is usually observed in Catholic countries.

January 14—20. — At five in the afternoon we remounted our sledges, and in six days found ourselves in Tomsk, after travelling over a distance of eight hundred versts. In the first village through which we passed, a superior degree of comfort was observable; the walls of the gornitsa, instead of being distinguished from the isba by a coating of white-wash, were neatly covered with paper-hangings, which are manufactured by the convicts at Omsk. One of the ornaments of the apartment was a bright tea-urn, (samavar,) which was placed at our command by the hospitable owners.

In the course of this night we crossed the Irtuish for the last time, and, early on the 15th, found ourselves one hundred versts from the town which we had just left. The commencement of the Barabà (steppe), which we had now reached, showed itself in the more regular outline of the monotonous waste of snow. On the left of our route, near Kopyova, we passed close to one of the memorials of the aboriginal natives of the country; it was a barrow, or ancient tumulus, such as the Siberian Russians call a Kurgand, of about thirty feet in height, and shaped like a bell. We found none but Russian settlers in all the villages, their former occupants having retired northwards after the game. A few of the descendants of the latter, however, remain, but are no longer distinguishable from the Russians.

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In Tokrovskoe Selo, 250 versts beyond Tara, I succeeded in making a magnetic observation; and here I also encountered one of the Ostyaks who occupy the country to the northward of the steppe. He had come to exchange peltry for flour and other Russian products. His dress alone was sufficient to distinguish him from an Ostyak of the lower Obi, being made of the long-haired skin of the wild goat, not of the rein-deer. The colour of the goat is a yellowish white, never presenting the varieties observable in the rein-deer in its half-domesticated state.

Dresses such as these are very common among the Russian colonists; who, like the Samoyedes, wear them open before, and so short as only just to reach to the hips. A high conical cap of black sheep-skin, with two long strips hanging down at either side of the head, and uniting on the breast, along with a collar of squirrel's skin, constitute the rest of the apparel of the Russian peasants here.

The district between Pokrovsk and Kaïnsk, is one of those low and broken parts of the steppe which are distinguished at once, even in winter time, by wide tracts of reeds that force their way through the snow. These swamps, the remains of inland seas, render the vicinity exceedingly dangerous for summer residence, and cause much annoyance, even to the traveller, at that season. The flies and gnats become then so tormenting, that it is impossible to venture abroad without a covering for the face, and the cattle even are obliged to be smeared with tar. It is in the hot season, too, that that terror of natives and visitors, the Siberian plague (Sibirskaya yazva, as it is called,) prevails. This malady is known to cut off frequently both men and cattle in the course of a few days. It is, however, much less feared now than formerly, as it has been found that puncturation with a needle upon the exposed parts of the person, will, if promptly resorted

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to, always prevent the extension of the irritation and swelling which invariably accompany the progress of the disease.

Antóshkina and Bulátova are two miserable settlements of convicts, and maintain the character for insecurity which this side of the Barabà had earned for itself before Kaïnsk was built for the protection of travellers. We entered Bulátova at nightfall. Still there appeared nothing to justify the apprehensions of our yamshchiks, who hurried us past the miserable cottages at full gallop.

The external aspect of Kaïnsk is gloomy and repulsive. It contains nothing but mean and ill-built huts. I determined to remain there a short time, in the hope of being able to make some astronomical observations, but was disappointed by the sudden outburst of a snow storm. The settler's dwelling in which we were lodged, was far more dirty and miserable than those of the generality of the Siberian boors. The whole family lay crowded in a single apartment, furnished only with the common boiler, and encumbered with confused heaps of old peltry and articles of clothing.

Very different is the state of things on the other side of the lake of Ubinsk. There the villages lie close together, and the houses, regularly built, have little balconies before them, and windows of mica, neatly fitted in large plates; which, with the well-finished wooden railings round the court-yards, give the dwellings an unusual appearance of respectability.

This district, as I was informed by an old resident of Chulùim, who was ninety-five years old, had been nothing better than an uninhabitable waste up to the year 1753, when he arrived from Kasan with a numerous colony of crown serfs, by whom the first habitations were erected in these parts. Up to the

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present day the population has been continually on the increase from the influx of convicts, who are hired out to the elder residents as servants and labourers, till they are in a situation to form household establishments for themselves. These unfortunates (for so they are termed) generally conduct themselves, as I was assured, with great propriety, and in the course of a very few years merge into the general mass of the inhabitants.

In Itkul, Sektinsk, and the succeeding villages which we passed through on Sunday morning (January 18th), we found the people, notwithstanding the severity of the cold, all up and busy in preparing to celebrate the new-year. The young women were dressed in their holiday clothes, and driven, six or eight together, in sledges by the young men, at full speed, from one end of the street to the other; the turn at each end being made with astonishing adroitness. The carol in which they joined was taken up by the young peasants who rode by, not in the sledges. These cavalcades were followed by numbers of large dogs, the barking of which, joined to the screams of laughter, and the plaudits of the lookers-on, added greatly to the excitement of the scene. This is the same custom which sets the sledges in motion on the Neva at this season in St. Petersburg, and which gave existence to the preparations on the ice which we witnessed at Tobolsk; and which is, in fact, observed with similar rejoicings in every quarter of the empire. It is rarely that the festival can be enjoyed with more zest, or present a spectacle of more unusual interest to the stranger, than in the icy region of the steppe of Barabà.

The dogs kept by the Russians of Barabà show their affinity with those bred by the Ostyaks, not only by their size, but also by their make and colour. They are about the height of a full-grown wolf,

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with bushy tails gracefully curled, differing from the former only in the greater length of their hair, and less sharply pointed ears. I bought one of them at Itkul, and he followed me to the west coast of Kamchatka. His speed at the new-year's sports, just described, had attracted my attention. His coat was white, beautifully spotted with black, but he had a black tail with a white tip. I was afterwards informed by Tunguzian connoisseurs, that this variety (or at least the individual which I possessed) have great natural capability for speed, in consequence of their ribs being set very far asunder.

A little further on we met a great number of one-horse sledges, from the circle of Byisk, in the government of Tomsk, laden with large cylindical vessels of honey for Tara. This alone would be sufficient to refute the oft-repeated assertion that there are no bees in Siberia. Honey is also found in great quantities in the government of Yenisei.

The snow upon our route had now assumed that wavy condition of the surface which is the result of constant travelling; sharp parallel ridges occurring at half a horse's length from each other. They are produced by the treading up of the snow under the horses' feet, and extend across the entire road; for here they yoke abreast, and it is only in the more northern parts, where the tracks are difficult to find, that they have recourse to the goose-file.

January 19th brought us, early in the morning, to a considerable village named *Krutie logi* — the steep valleys. Here, first, we came upon a wooded hilly country, as the name implies, traversed in the neighbourhood of the settlement by deep ravines trending to the northward. Here the steppe terminates. The inhabitants of Krutie logi call themselves "miners," because they are obliged to supply charcoal and means of transport for the smelting-houses of Bar-

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naul. Their own land is, notwithstanding, well cultivated; every house in the place has its enclosure, which is cropped in summer as a vegetable garden.

The next post-station, Kolivan, has lost the dignity of the chief town of a government, which it enjoyed till the close of the last century. A few of the buildings lately erected, carry something of the air of a city; all the rest are merely log-houses, as rude and untrimmed as are to be found in the villages. They lie in a row on the heights, while the Obi flows like a mountain stream through a narrow chasm at their feet. A seam of clay slate crops out of the sand at a great angle with the horizon, and is pronounced by the Altai miners to be an offshoot of the transition formation of that chain. The crest of the ridge of hills, separating the Obi and the Tom, is visible in the distant south.

We made a halt till the evening in a well wooded spot on the right bank of the Obi, much delighted with our retreat after our long journey over an unsheltered waste. The woods were fir and pine, with many magnificent specimens of the Cembra among them. The nuts are gathered here as an article of trade.

The snow track had now become so hard, that our progress was very rapid. Testra*, the dog that I had brought from Itkul, continued his attendance on his new master till we came to Dubrova; where he arrived soon after us, with his feet so cut and wounded that he sank exhausted on the snow. Hitherto I had found it fruitless to attempt to entice him into my sledge, but I had now no difficulty in reconciling him to a comfortable berth in it, which in a very few days he learned to enjoy.

* The name I had given him was Hector, but this was soon rejected by the Siberians in favour of the more familiar one of Testra, — spotted; which is a common name for such dogs among them.

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This forest district is inhabited by Tatars, with whom we had some further intercourse at Tatarinskaya Stantsia. The pines grow close up to their huts, which are of a square form, with flat roofs, and constructed of rough round logs. These yurts are, however, higher than those of the Ostyaks, and taper slightly towards the top; so that they present something of the appearance of towers, and at a little distance, among the trees, look not unlike old German castles. These people are, moreover, distinguished from the indigenous tribes of the north by their more civilised and agreeable exterior. The women, who were engaged in cooking when we saw them, wear a long white wrapper, with which they also cover the head when they leave the house. The younger females, as well as the men, are slight in figure, and have regular and expressive features. But they soon get a look of age, and wrinkles disfigure in a few years their yellow haggered faces.

Towards night we came to Oyash, a well-built village, with large and new court-yards. We observed some blocks of coarse-grained granite lying on the banks of a rivulet, which rises in the hilly grounds adjacent: these were the first stones which I had seen to the eastward of Samárovo.*

In the fruitful tract which we traversed on the 20th also, the Russian population seemed to be prosperous and comfortable. At Varyukhina, for instance (fifty versts from Tomsk), one of the peasants had provided a great baking of honey-cakes (pryaniki) for sale during the Christmas. This branch of industry seems tolerably remunerative here, judging from the demand for the European dainty, which was as much in request as the Cembra nuts.

* Vol. I., p. 419.

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CHAP. VI.

ROCKS ON THE TOM. — APPEARANCE OF TOMSK. — RUSSIAN BIGOTRY. — THE CONQUERORS OF SIBERIA. — TRADE OF TOMSK. — OPEN WELLS IN WINTER. — EXPLANATION OF THIS PHENOMENON. — ACHINSK. — PLAIN OF KRASNOYARSK. — DESCRIPTION OF THE CITY. — ITS IMPORTANCE. — NAVIGATION OF THE YENISEI. — LUXURY OF KRASNOYARSK. — ROSE WINE. — SIBERIAN POETRY. — TUNGUZIAN DANCES. — RELICS FOUND IN THE KURGANS. — ORIGIN OF THE OSTYAKS. — BANKS OF THE YENISEI. — TEMPERATURE OF THE SPRINGS. — PRODUCTIONS OF THE SOIL.

At two o'clock we passed the Tom and reached the city named from it, after a short ride through a fertile country on the east bank. Just at the point where we crossed the river, it cuts its way through perpendicular strata of a black slaty clay, which takes a direction towards the eastward. Decomposing pyrites and alum appear in several places upon this declivity, and are collected in large quantities by the inhabitants, both for their own use and for sale. The great inclination of the strata shows that they must have been displaced from their original position by the same great convulsion which upheaved the Altaic chain itself, which would render it a question of still more interest to determine the geognostic age of this formation. Impressions of algæ were observed in them by Pallas, along with the Eschara foliacea and a small variety of Pectunculus. Comparing these points with the mineralogical character of the schists, and the affinity between them and the more determinate formations in the valley of the Yenisei, near Krasnoyarsk, we are strongly tempted to class these rocks with the aluminous slate, which lies in con-

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nection with the lower oolitic group in Germany (the Swabian Alps) and other countries.

January 21—23. — The principal part of Tomsk is situate between the right bank of the Tom and the ridge of hills which accompany its bed. The suburb inhabited by the Tatarian and Bukharian part of the population lies upon the south of the main line of streets, displaying from between its low but regular wooden houses, the slender towers of several mosques. The great road passes through this lower part of the town, within which it is still distinguishable from the ordinary streets by the breadth of its accommodation. A wooden pillar is erected in the middle of the city, giving the distances to St. Petersburg and Moscow, and which leaves an impression on the mind as if it were more important to travel than to remain at home.

The houses which stand upon the hilly ground above the river, which has received the name of the Voskresenskaya gora, or hill of resurrection, are larger and of more imposing appearance. The house assigned to us was upon this height, and, though of an antiquated character, was still in a better style than any we had yet seen in Siberia. It consisted of two storeys, the upper of which was reached by a broad, ill-lighted staircase, with many turnings, and within the house. The entire arrangement called to mind the quaint old buildings which are still sometimes met with in Saxon towns; but, according to the ideas of the natives, it constituted a perfect model of convenience and taste.

The knowledge of the fact of our being lodged with a family of bigoted schismatics, was forced upon me in a manner not the most agreeable, by their refusing to supply us with any other than broken and unserviceable utensils for our table or cooking. They had been persuaded that we were foreign infidels, with whom all intercourse was forbidden to the faith-

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ful. I was consequently obliged to open negotiations with the master of the house, a man advanced in years, and, though subdued by excessive mortification, of unusually large and powerful frame. He assured me that, not only the Mohammedan Tatars, but even the Jews, were considered more of a Christian people than the Germans; for the former would, both of them, observe a fast or abstain from particular meats, whereas the latter indulged in any abomination at any season. He likewise expressed the annoyance he felt at my keeping such an unclean and accursed animal as a dog in my chamber. The fanatical simplicity of these prejudices, however, which present a sort of parody upon their own creed, are much less obstructive to social intercourse than the more subtle scrupulosity of European sectarians. I soon succeeded so far in explaining away the conscientious difficulties started by our pious host, that he concluded with a promise that we should have the use of his great kettle to make our tea the following evening, and that we should be favoured with his company. He came in his short jerkin of skins, which, notwithstanding its dilapidated condition, lent an air of activity and energy to his attenuated person. He informed me that himself and family felt themselves slighted by being taken for ordinary burghers: his ancestors were Boyars; that is, belonged to the ancient Siberian nobility, which was now suffered to fall into decay. And, in fact, it was not impossible that his pride of birth might be justified in tracing his descent from the Kosaks of Tomsk, whose services to their country in the seventeenth century had been acknowledged by conferring on them the title of Sons of the Boyars. Properly considered, there are few more extraordinary events recorded in the history of the world, than the subjugation of an eighth part of the surface of the globe within the period of eighty

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years, and that too, by the political address and spirit of endurance, evinced by an unorganised body of men; for after the death of Yermak there was scarcely ever a leader among them who could be said to have concentrated the national energies in any one comprehensive plan of operation. From the time of the foundation of Tomsk, there is hardly an instance of the extension of Russian conquests, in which its inhabitants have not been conspicuous. The first step towards their future influence was their obstinate resistance to the wild and restless Kirghis: though this was somewat compromised about ten years afterwards, when the numerous hordes of the still unsubjugated Tatars were incited to devastate the Russian territory, till the Kosaks found that their only place of refuge was the city, where the obstinacy of their resistance alone saved them from the fury of their enemies. Assistance from Europe was not to be thought of, owing to the disorders consequent upon the pretensions of the usurper Demetrius, and the interregnum which succeeded. Yet two years more had scarcely elapsed till the policy and address of the adventurers recovered their dominion over the Barabinskians, the Chats, the Umaks and those tribes subject to Altuin Khan, which are settled upon the Altai and the borders of the lake of Teletsk. Some small parties had even the boldness to venture into the territories of the Yakuts of the Lena, and pass over the mountains of Aldan; till having reached the remotest point of the continent, about the year 1639, they made themselves masters of the whole eastern coast, from Okhotsk to the mouth of the Ud.

The services of these daring conquerors, however, have remained unrequited, either by investiture with territory or any other heritable marks of favour; on the contrary, we may describe the Starozhilets, or primitive Siberian colonists, as ranking just as

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much below the European Chinovnik*, as the posterity of the original conquerors of Mexico were there thought inferior to the haughty officers just arrived from Spain.

Still it is only in rare cases that the old Siberian families are seen to give way to these splenetic reminiscences of the past, after the fashion of our host. One good quality at least which they inherit, is the endurance of privations with a sort of indolent resignation, along with a natural dexterity in availing themselves of every advantage presented by their present social position. The natives of Tomsk, as well as the other immigrants in general, take an active part in that system of commercial barter which is carried on, in every variety of form, from the Sea of Okhotsk to the Ural, and from the Frozen Ocean to China. This, too, they prosecute so much upon their own responsibility, that they are nearly as independent of the mother country now-a-days in their trading, as they were centuries ago in their plundering expeditions. It is their spirit of adventure alone, which, as it once caused the uprise, is now the support of Russian influence in Siberia.

Many of the Russian convicts exercise little trades calculated to introduce the luxuries of European life. We encountered here, for instance, what is called a Svitinshchik, selling an agreeable and exhilarating liquor, prepared from honey-water and spices; and which he carried in a sort of kettle, kept warm by rolling it up in several folds of cloth. A large glass of this svitin was to be had for two copeks. Other dealers were furnished with medovòi mak, a compound, as the name imports, of honey and black-poppy juice; which is reduced to a stiff consistence, and retailed in little cakes.

If credit were to be given to the opinions of our

* Chinovnik — dignitary or noble.

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entertainer, which, however, were seldom too favourable to any of the new-comers, the pursuits of the convicts were not always so free from blame. According to his account, there was no murder nor robbery committed, — and in enumerating these he was equivalent to a Tomsk gazette, — which was not to be laid to the charge of Europeans.

January 23—26. — We left Tomsk on the 23rd, about mid-day. The high road runs in an eastwardly direction across an elevated plain, intersected by deep, and often wide, valleys. The streams in them take a northward course. The birch and poplar grow in close and stately forests above, while nothing but the larch, the fir, and stone-pine is found below, where there is shelter from the wind. All the Russian settlements lie in these hollows, where they have at once the advantage of the water and a fruitful soil when the woods are cleared.

The variety of vegetable productions in this district attracts large quantities of game. We saw nothing, however, but foxes, which came boldly up to our sledges as we travelled by moonlight.

During these few days the temperature of the air sank to — 23° R. just before sunrise, though during mid-day there was some melting of the thick coat of snow upon the south side of the trees, which was transformed into a bright covering of ice soon after.

On the 24th I proceeded with my magnetic observations at Podyelniki (188 versts from Tomsk). We were surprised at being told here that we should find water in the open wells behind the houses, which we found to be a fact; though in the little shafts which are sunk where the plain has an elevation towards the eastward, the water is only fourteen feet below the surface. A bucket of this water, which we tested immediately after drawing, gave + 0°· 50 R., while the atmosphere was as low as — 19°; a proof that

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the strata, fourteen feet below the surface, must have a temperature much above the freezing point. Still the question remains to be answered, how the wells of Podyelniki come to have a constant supply of water during the winter, while those of Nijnei Tagilsk on the Ural, where the ground has a degree of heat amounting to + 2°· 36 R., should be frozen-up half the year. In this latter case it is not difficult to conceive that a shallow bed of surface-water, but just underground, might have its sources cut off by the freezing of the superficial strata through which its supplies must be received; while in the deeper shafts at Perm and Bogoslovsk, we should find an equal flow of water, both in winter and summer, because periodic alternations in the supply being governed by the same laws as those of heat and cold, could hardly be sensible at any considerable depth.

All difficulties attending this question will consequently disappear, if we presume that the fountains of Podyelniki have their sources in the distant hills to the southward; and, thus, that the freezing and suspension of the subterranean current is as effectually prevented by their mass in this instance, as it is in Perm and Bogoslovsk by the thickness of the strata whence it flows. The exhalations from the wells had settled on their brims in crystals of hoar frost of unusual size.

It was in the dense woods through which the succeeding part of our journey lay, that we observed some buntings (Emberiza), the first of the smaller birds we had seen during the winter. They live upon the seeds which are preserved uninjured by the frost. The umbelliferæ formed a large portion of the vegetable production of the woods, and capsules full of seeds hung upon the mallows. Hitherto, magpies were the only members of the feathered tribe which we had encountered; and these would invariably

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attend our sledges, not only here, but beyond Obdorsk, when we were within the polar circle.

On January the 25th, we passed the boundary of the circle of Achinsk, which is the first within the government of Yeniseisk, and consequently in Eastern Siberia. The city of Achinsk, on the right bank of the Chulùim, owes its importance to the transit trade, and exhibits the thriving condition of the inhabitants in the handsome exterior of the houses, of which it contains 336. It has both an office for the examination of merchandise, and a stone warehouse for their accommodation. A number of sledges laden with wares for Irkutsk were drawn up before the latter building. Our podorozhnaya saved us from any detention.

We had now begun to note indications of our approach to the Chinese frontier. At Kasulka, 110 versts before reaching Krasnoyarsk, we were followed by two mercantile travellers, who were on their road from Irbit to Kiakhta. They were somewhat imposingly dressed in their dokhi or short pelisses of wild goat skins, and were received by the natives with much greater appearance of good-will than fell to our share. They were treated as old acquaintances, having to make the above-mentioned journey twice every year.

We crossed the mountain of Kemchug during this night: a river of the same name rises on its northern declivity, but takes at last a westerly direction and falls into the Chulùim. The elevation of this district has an obvious effect on vegetation; it is impossible to grow cucumbers here, though they thrive so well in all the Midland and Southern circles. We found ourselves, on the morning of the 26th, at the station of Sasedéyeva, continuing still to rise; and after a further drive of sixteen versts were suddenly presented with a view of the romantic plain of Kras-

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noyarsk, stretching away from the foot of an abrupt declivity, and exhibiting the course and union of the Kacha with the Yenisei. It was near mid-day; the sky was clear and still, but as we wound down the mountain sides we saw the valleys at our feet filled with a sort of mist; nor was it till we had descended to the bottom that we were able to discover that it was owing to a cloud of snow and fine sand, raised by a sudden squall of westerly wind, so violent that I was blown over several times by it in my sledge. It seemed to be a genuine burán, which, however, had not extended its fury to the upper ranges of the valley.

January 26—31.—I now rejoined MM. Hansteen and Due, after a separation of more than two months. Our meeting notwithstanding was only for a few hours, as they were just on the point of leaving the city; which had, at the same time, something so attractive for me in its appearance, that I found it impossible to deny myself the gratification of a longer sojourn.

The low plain upon which Krasnoyarsk is built is included between the Yenisei and the Kacha at their junction. The northern and longest side of the obtuse-angled tongue of land between these rivers is bounded by the hill called Aphontovaya. This hill is a continuation of the eastern declivity bounding the valley of the Yenisei on the left; it is from the red marl of which it is composed that the city takes its name.* On the right the plain stretches away for nine versts; and in the S.W. a blue range of hills is descried, which betray their rocky character by their sharp and picturesque outline.

The breadth of the river bed is increased by three islands here, which are covered with a thick growth of robinias, mespilus, and Prunus padus, forming a natural garden for the inhabitants. These islands

* Krasnoi, red; yar, a cliff. Russ.

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are surrounded by naked sand-banks in the autumn when the water is low.

The Siberians assert, and with much appearance of truth, that the natural character of their country begins to show itself under a more pleasing and varied and cheerful aspect, when the valley of the Yenisei is reached. This is indeed evident at the first sight of the hills near Krasnoyarsk; while a certain degree of elegance and modern taste is equally obvious to the traveller in the social arrangements and general plan of the city itself. The principal street, through which we drove, forms a wide and well-levelled mall, bounded by a regular line of houses on either side, and intersected at right angles by several cross streets similarly planned. The houses are all sheathed over with even planking, and painted with bright colours on the outside. Instead of plates of mica the windows are furnished with large panes of glass from a manufactory in the vicinity, so that we might easily fancy ourselves transported into one of the most commodious of the suburbs of St. Petersburg; this impression being further strengthened by the two handsome squares in the middle of the town, as well as by the imposing exterior of the cathedral, just at the mouth of the Kacha, and the spacious buildings appropriated to public offices, which are generally of stone.

Here, as in all other Siberian cities, the first visit of the stranger must be paid at the police office, where he is handed over to the compulsory hospitality of a native. In the discharge of this duty we generally found the Kosaks very alert and communicative, but here their slender figures were rendered so much more graceful by the elegance of their uniforms and the completeness of their entire equipment, that I cannot call to mind having seen any thing equal to them before or since in all Siberia.

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Since the year 1822, when the present system of administration and of police was introduced by Speranskyi, the importance of Krasnoyarsk has made a rapid and uninterrupted advance. It has now become the residence of the governor and other functionaries of the government of Yeniseisk; which comprises five circles, with 191,500 inhabitants, within a territory of 1,235,000 square miles in extent, lying between 51° and 78° of north latitude. The over-land route, which connects Western Siberia with Irkutsk and the Transbaikalian provinces, now runs through Krasnoyarsk, which finds in this arrangement, as well as in the productions of the neighbouring district, a more than sufficient equivalent for the advantages of water transport. This is still almost exclusively confined to the northernmost circle (of Yeniseisk), through which the productions, both of China and of the mines of Nerchinsk, pass on their way to Europe, following the course of the Angarà or upper Tunguzka to its junction with the Yenisei; when they next enter the Kem, after leaving the city of Yeniseisk, then traverse the portage or volok of Makovskyi into the Ket, whence they descend into the Obi, and are finally conveyed into the Irtuish at Samárovo. It will be seen that these caravans touch no point of the government of Yeniseisk lying to the southward of 58°, so that there are seventy of the oldest and richest merchants who reside constantly in Yeniseisk, in spite of its northern situation and the inclemency of its climate at 58°·45 of latitude.

Krasnoyarsk is mainly indebted to the exertions of the governor, Alexander Petròvitch Stepanov, for its present prosperity, and the agreeable character of its exterior. This meritorious officer took up his residence constantly in Siberia, having imbibed a strong predilection both for the country and its inhabitants; and possessing, besides, every quality necessary to

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form the character of a great statesman and public benefactor. His own household was a perfect model for the inhabitants of a Siberian city, for in it were to be found not only the conveniencies, but even the elegancies of a European dwelling, all supplied from the ordinary resources and productions of the place. One essential step towards improvement, was the foundation of a public factory or workhouse, for the employment of the numerous artisans who are sent every year, as convicts, to Krasnoyarsk. This building is divided into separate workshops, in which all orders are executed, each in its special department, and the proceeds placed to the general credit of the institution. The tanning of leather, and construction of all sorts of carriages, for instance, is carried on here, with as much success as in Russia itself. Droshkies, and sledges, are built in this city, which, with their spirited Minusinsk-tatar horses, would attract notice any where.

The table at Krasnoyarsk is abundantly supplied with a variety of delicious viands that might readily dispense with the adscititious aid of Russian cookery, even though it be able, according to the national adage, "To convert anything into a pasty." Their vegetables are so abundant in all their kinds, that they are stored up for winter use; while, to the animals generally used for food in Europe, we must add the rein-deer, of which the tongues are much in request, and the wild goat, besides a profusion of partridges, and many other sorts of feathered game. By the experienced gourmand, the sterlet of the Yenesei is certainly pronounced inferior to that of the Volga; but, on the other hand, their salmon and barbel are unexceptionable.

We were treated with Madeira, too, and other wines imported from Europe. The natives seemed much disposed to complain that they were too much

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limited in their choice, by the want of enterprise of their merchants, who contented themselves with the fur trade, and other speculations, in the government of Yeniseisk, instead of extending their connections to Irbit, or Nijnei Novgorod, where the traffic was entirely in the hands of the Western Siberians, who supplied those markets from Europe.

These foreign importers are not merely passing visitors, but keep up a large stock of the articles in which they deal, during the whole year, in Krasnoyarsk. The price of all European articles is consequently so much under their control, as to make it a question, deeply involving the common weal, whether native substitutes for them cannot be found. Among attempts of this kind stands, first, the conversion of brandy into nalivki, by reducing its strength with Chinese sugar and the expressed juices of indigenous fruits. These Siberian compounds are by no means deserving of the reprobation with which distilled liquors are generally treated by the *bon vivants* of Europe. The spirit they contain is not more than the sixth of that of British punch; the genuine nalivka consists, according to the most authentic formula, of water, berries, sugar, and brandy, in the proportions (by weight) of 6, 2, 1, and ½. The preparation will generally occupy one month, as the fruits *, whatever may be chosen, must first be left to soak twelve days, in the proper quantity of water and brandy; the sugar is then added, and the whole left to ferment, — first, for three days in an open, and then for two weeks in a close, vessel. When fit to drink, each species of nalivki retains the peculiar flavour of the fruit with which it is made.

There was one of these factitious wines, which I

* The raspberry (Rubus idæus), cow-berry (Vaccinium, Vitis idæa), cloud-berry (Rubus Chamæmorus), and the dwarf crimson bramble (Rubus arcticus).

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never afterwards tasted in Siberia. It was a very sparkling, and rather heady liquor, of a bright red colour, and extraordinary transparency; and was made from the leaves of the wild rose, according to the same process, probably, as the other nalivki. The name given it is Shimpovka, or rather, more correctly, Shipovka, from shipovnik the primitive Russian term for the rose bush. Strange, that in bestowing a name upon this shrub, any people should have been influenced by the thorns (*shipi*) rather than by the flowers, and thus be obliged to adopt the foreign, but less objectionable term, rosa, in refined conversation and books.

On the second day of my sojourn in Krasnoyarsk, I was invited, by M. Stepanov, to a literary soirée, which was altogether conducted in the best European style. I must not be understood, in this, to limit my commendations to the lighting and tasteful decorations of the saloon, which was provided with the latest Russian journals, as well as with the incomparable Kiakhta blossom-tea,—a delicacy unknown to the most refined assemblies in Europe, — but must likewise extend it to the lively interest evinced in favour of Byron and Scott, and to the spirited defence of their works, against a critique which had just made its appearance in the *Moscow Telegraph*. The company consisted exclusively of men, the majority of whom were natives of Siberia. These discussions upon our literature induced many of them to try their own poetic talents; some specimens of which have been offered to the public in the Yeniseisk Almanac, the first number of which was printed in Moscow in 1828.

The editor of this collection was M. Ivan Petrov, one of the youngest of the contributors, who had been born in Irkutsk, and received his entire education in Siberia. The peculiarity of his style would have had

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a very high degree of attraction for the European reader, were it not for an undue profusion of allegorical allusions, which gave his poetry very much of the Turkish or Persian character.

Notwithstanding this, however, there was something peculiarly engaging in his descriptions of Siberian scenery, owing to the primitive simplicity and striking uniformity of the social and natural condition of the land. It is by these local peculiarities, and an expression of frank good-nature, attributable to the circumscribed range of ideas and pursuits, that the poetry of Kusmin, and of Amvrozov of Yakutsk, is characterised. It is a strange coincidence that the unsophisticated enjoyments of provincial life should be represented by those officers, who have been withdrawn from the oppressive and corrupting influences of the Russian capital, under the very same colours as they appeared to the Roman poets under the Emperors. Many an ode, composed in Krasnoyarsk, might be found to accord with the feelings and sentiments of Horace. As a striking example of an opposite constitution of mind, however, we may quote the words of the poet Rodyukov, who thus describes himself taking leave of one of his friends. "Born in the Steppe, a child of the icy zone, I am darkened with the smoke of the Tatar fires, like the yurts and the skins of the tents that afford me shelter. Shy as the beasts of the forest, or as the fish which flee from pursuit, the rude Siberian is dark and unsocial. His greeting is artless and brief, and even his parting words no more than 'God guide thee, fare thee well; enjoy in the city all thou canst desire.'"

The picture given by Stepanov of human existence on the northern tundras is, in the highest degree, expressive. "They seem inaccessible to either joy or pain, the types of everlasting rest." Well might we wish that every governor were endued with the

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same poetic spirit in which he addresses some of the Tunguzes recommended to his care. "Come ye timorous denizens of the wilds, come down to the river banks from your rocky homes, and be my friends. In me ye shall find a brother, for I fear my fellow men no less than ye."

It was also to my visit to Krasnoyarsk that I was indebted for an acquaintance I formed with an old Tunguze, from the circle of Yeniseisk, who had been for some time in the hospital here, and was now preparing to return home. This man was distinguished from his brethren of the same tribe by blue lines tattooed upon his cheeks. This operation is performed here, as in the South Sea islands, by rubbing finely powdered charcoal into punctures made with needles in the skin. Instead of the charcoal, Indian ink, as I was informed, is sometimes used, which the Tunguzes have opportunities of procuring through their intercourse with the natives of the countries bordering on Southern Siberia. The names by which tobacco, as well as pipes and sulphur, is known to the Tunguzes, being of Chinese origin, would suggest that they have drawn those articles in the earliest ages from China, where the peltry of their more northern neighbours is so highly prized. This account, given by eye-witnesses, of the mode of tattooing, is much more credible than another which is traditional in Siberia. By the Russians the operation of tattooing is expressed by the term Vuishivat, to ornament with needle-work: so that a tattooed face is said to be "embroidered." It is probably, therefore, from a mere etymological misconception that the notion has arisen, that the dark figures traced on different parts of the persons of the Tunguzes and others, are black threads drawn under the skin. The lines upon the hands of the Ostyak women at least, as well as upon the faces of the Tunguzes, whom I

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examined here, are evidently mere punctures on a level with the surrounding skin, whereas they should rise considerably above it, if formed by threads left underneath; the more so as the needles brought to the northern markets must always be thick and strong enough to sew with the sinews of the reindeer: the fine ones, which I offered to the Ostyaks on the Obi, were rejected as useless.

This good-humoured old man showed us some of his national dances, which precisely resemble those of the Tunguzes on the Aldan. He described how each man offered his right hand to a woman, and that they then formed a circle, in which they moved slowly round, keeping time to the cadence of certain words. It is affirmed by the Russians, however, who have visited Turukhansk, that those dances do not always end with the same gravity with which they begin, but upon certain occasions become almost as licentious as those of the Susliniks or the Agathyrsi. I attempted to come at the truth of this assertion from the Tunguze without an interpreter; but though he understood some Russian, he had much difficulty in expressing his meaning in that language; still I thought I could gather from him, that he did not intend to gainsay the imputation altogether, for he appeared to understand the words, which, as the Russians allege, are the signal of preparation for the lewder orgies. The marriage tie is considered indissoluble by the northern Tunguzes, and, though they allow a plurality of wives, these are generally treated with kindness and affection; though it is usual to resign one of them to the Russian adventurers who visit the tundras in the summer, from whom they expect a share of the proceeds of their hunting excursions in return.

With regard to ethnographical subjects, I must note a most interesting collection of Siberian anti-

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quities in the possession of M. Stepànov. It principally contains articles of bronze, found in the Kurgans, or strangers' graves, as they are called in the circle of Minusinsk, at the foot of the Sayan and Kusnetsk mountains. In addition to the fragments of weapons, mining-tools and trinkets, already described by Spaskyi and others, we were here shown a number of circular metallic discs, of four or six inches diameter, one surface of which was polished for a mirror, while the opposite side was uniformly furnished with a sort of button, having a hole drilled through it, and which was evidently intended for a handle. The exterior rim surrounding this button was ornamented with elegant figures in relief, which, as well as on the other articles, were almost always representations of animals. I was much surprised at never seeing among these the argali, or wild sheep, which is so constantly found upon the monumental reliques of the nomadic Siberian tribes; whereas the ass, which is in such universal request in the southern adjacent countries, occurred in almost every compartment. The most important consideration, however, is, that these mirrors are found in graves which, as the present Tatar inhabitants of the circle maintain, belong to a race now extinct, and totally different from theirs. Now, we know that mirrors, precisely similar to these, are still in use among the Buraets in their religious ceremonies, and that they are peculiar to the ritual of the Buddhists; and they thereby furnish another argument for the antiquity and extended influence of this remarkable creed. It might at the same time admit of debate, whether those primitive tribes, whose existence is now only attested by the peculiarity of their burial places, and their enterprise in search of ores, were really a race so distinct from the modern inhabitants of Siberia, as might be presumed from the name of Chudes or

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strangers, given them by their Russian successors. If any weight could be attached to an appellation so variously applied, might it not be maintained that the Chudes were the ancestors of the modern Ostyaks, a designation indisputably derived from the Tataric word Ushstyak, a stranger.

Here again, however, our present information is at fault. The name Ostyak is itself equivocally bestowed: we find it given to a tribe in the north of the present government of Yeniseisk, whose mother-tongue bears a close affinity to the Samoyedish, and still closer to that of the Yarintsi in Krasnoyarsk, and who are, notwithstanding, traditionally acknowledged by the Ostyaks of the Obi as a branch of their own stock. The following account of their origin was given to M. Stepànov, by one of the chiefs of the Ostyaks of Yeniseisk. "Once as our horde journeyed from the setting towards the rising sun, it was found upon their coming to the river Tas, that but four of each sex remained alive. These, too, must have perished of hunger, but that one of them was an inspired soothsayer, or Chvochibúikub: on a sudden, wings appeared upon his shoulders, he first raised himself into the air, then darted down into the Tas, and emerged with his body hung round with fish. Henceforward his companions became fishermen."

Homer seems to have thought that fishing was the last resource of hunger.* This would sound strange to one brought up on the borders of the teeming rivers of Siberia, and could only be imagined to hold true in the case of recent emigration. Accordingly, we find the rich and delicate sustenance derived from the waters so much esteemed at last, that posterity comes to regard the art of taking fish as an endowment from heaven.

The result of my observations on the wells of

* Odys. IV., 368; XII., 329.

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Podyilniki made it desirable to note the temperature of some running stream in this vicinity, near its source. I was consequently glad to learn that there were several copious springs about Krasnoyarsk, and made an excursion on the 28th of January to ascertain this point, and examine the rock formations in the valley of the Yenisei. Upon M. Stepànov's suggestion, I availed myself of the company of a gentleman holding a public appointment, who had acquired a complete knowledge of every circumstance connected with the government of Yeniseisk and its inhabitants. Our route lay westward at first, along the Yenisei, at the foot of the hills, which were just against the north-east end of the city, and where we intended to visit a little rivulet which rises from them, known by the name of "the roaring well." Notwithstanding this imposing title, we were assured by the peasants in the neighbourhood, that its source was completely hidden under the snow; but that we should be able to gratify ourselves at Basaikha, which lay a little lower down on the right bank of the Yenisei. Here we came to a wide chasm through which the Basaikha flows into the Yenisei. Its sides are formed of high and steep cliffs of pituresque outline, being a succession of parallel ridges following the direction of the main river, which here runs east and west. The remote back ground of this valley is closed by the peak of Kuisuimsk, which is of granitic formation, though the steep strata on either side of the streamlet consist of dark-brown shivery limestone, yielding, when rubbed, a strong sulphureous odour, and pierced here and there with seams of white calcareous spar. The dip of the stratification was to the N. W., as might be expected from the characteristic features of the hills just noticed, as well as from those of the valley of the Yenisei itself at Krasnoyarsk; and as long as the valley takes an

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easterly direction it has the longitudinal character, presenting to the river the edges of the rocky strata which form its sides.

The fountain of which we were in search was discovered on the right bank of the rivulet into which its waters are discharged. After shovelling away the snow, which stood two feet deep upon it, we exposed a powerful jet of water, issuing from a fissure which crossed the strata in a horizontal direction, and falling into a basin in the lime-stone rock below. During several trials I found the thermometer to rise from —15°, at which it stood in the air, to + 3°·10 R. when it was plunged into the water. The copiousness of this spring would seem to guarantee its admissibility as a standard of the internal heat, at least that this cannot be less than + 3°·10 for Krasnoyarsk. I was agreeably surprised to find the Gammarus pulex in great quantities in this spring; it was from 6‴ to 8‴ long, and the females had the space between the second and fifth rings filled with black round eggs. There were also many specimens of the Asellus aquaticus and Nepa cinerea swimming in the water. They owed their preservation, no doubt, to the covering of snow by which they were protected from the external cold, which to-day was —15° R.

The general aspect of the surrounding landscape was enough to prove the climate of this circle more favourable to vegetation than any other hitherto visited by us on the east of the Ural. Thickets of birch and alder, occasionally intermixed, as we were told, with the black alder and medlar, covered the gentle slopes in the valley of the Basaikha as far as the eye could reach; while both sides of the Yenisei were ribbed with furrows where the westerly winds had swept the snow from the dark and loamy soil. In some of the low grounds in Krasnoyarsk the vegetable mould is from two to three feet thick, and

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produces summer-rye, wheat, and oats, yielding eight, ten, and twelve-fold. Their seed-time does not begin before the first week in May.

We lingered a while in the agreeable little village situate on irregularly rising ground at the outlet of the valley. We found the cottages of the peasants, as usual, extremely neat, and their dress likewise indicative of a superior degree of comfort. The men wore handsome dokhi of goat-skins, and the women the serafan and tielogreika of coloured silks. They presented us with some water-melons, which thrive here in the open air when the beds are well manured. They are sliced and kept in salt and water, like cucumbers.

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CHAP. VII.

POTTERY. — SPRING AND ROCKS OF TORGASHINO. — IRON OF YENISEISK. — CULINARY SALT. — AMOUNT OF PRODUCE. — THE SALT LAKES. — SNOWLESS PLAINS. — FLOODS OF THE YENISEI. — KANSK. — ANNUAL INFLUX OF EXILES. — EXTREME COLD. — BIRIUSINSK. — POSTING IN EASTERN SIBERIA. — SANDSTONE. — NIJNEI UDINSK. — SLAN. — KURSAN. — LARCH FORESTS. — A REMARKABLE TRADITION. — MAGNETICAL OBSERVATIONS. — TELMA. — EXTENSIVE FACTORIES — GLASS — LINEN. — THE RIVER ANGARA.

Upon leaving Basaikha we passed the city and drove on to the village of Torgashino, on the right bank of the Yenisei, to visit some springs there also. Our postillion's inquiry, whether we wished to stop at the porcelain manufactory, was a suggestion so unexpected that my curiosity was excited to enter a small wooden house, the master of which addressed me in a foreign accent. I soon learned that he was an Italian, named Antonio Fornarini, a native of Ancona, who had followed the colours of Napoleon into Russia. He had settled at first, along with other prisoners of war, in Little Russia, but having engaged in some revolutionary attempts there, had been banished first to the government of Kasan, and subsequently to Krasnoyarsk. Here his thoughts were directed, by the mountainous character of the neighbourhood, to seek for the available productions of his native land; and thus he discovered, after a tedious search, a variety of clay, near Yeniseisk, applicable to the manufacture of china and earthenware. Many specimens of his skill were afterwards shown me in the city.

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The enterprising spirit of this man, who had married in Torgashino, where he seemed contented with his new home, was not yet satisfied with his first success. He was now busily engaged with the mineralogy of Wallerius, in the hope of being able to find in the mountains around, some minerals still more to his purpose. He was, besides this, employed in making sausages; and his cheese, he assured me, was not at all inferior to the Parmasan. He had even procured some pigeons from Kasan, which he kept in a warm apartment during the winter, and afterwards sold to bird-fanciers in the country. I may here add, that I encountered a Frenchman the next day in Krasnoyarsk, who had belonged to the old guard, and who was now steward of the household to the governor. He, too, had married a Siberian wife, and assured me that he had no desire to return to his native country, where he had been nearly forgotten, he supposed.

The houses of this village are on an easy ascent from the river, out of reach of the floods, but still at a good distance from the steep boundary of the valley. It was here we found a well, much better supplied with water than that at Basaikha. The bed of its outlet into the Yenisei, was covered with an arch of snow three or four feet high, but the roof was not more than a few inches thick. We forced openings through it, and found the inner surface covered with large icicles, and a long, feathery coat of hoar frost. The temperature of the spring, just as it issues from the face of the cliff, was found to be + 3°. 15 R., a gratifying approximation to that of Basaikha.

Fornarini, like all others who depend upon the test of sensation alone, would contend that this spring was colder in summer than in winter. The enormous vicissitudes of Siberian temperature, however, make this error more venial here than in Greece; where it

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was elevated by Aristotle to the dignity of a theorem, — one of the most impotent and unfounded in his system of meteorology, — the antiperistasis of heat.

The rocks at the springs of Torgashino are a bituminous limestone, of a smoky, grey colour; southward of this point they rest upon a coarse sandstone, but on the north bank of the Yenisei they are covered by the red marl formations which extend to the mountains of Kemchug, and of which these are principally composed.

On the side of the rocks of Kuisuim, to which I have already alluded, the limestone lies immediately upon the clay slate, which is in contact with the granite, and of which I saw some beautiful specimens at M. Stepànov's; they were partly enormous plates of the smoky-grey tabular limestone, and partly fragments of the denser and lighter-coloured strata in which these are imbedded.

On the summit of the Black Peak (chernaya sopka), about eight versts N.W. from the city, and on the north of the river, a brown hornstone, having much the appearance of jasper, is exposed to view. It occupies the line of union of the limestone with the red marl, and contributes much to the identification of the former with the Thuringian Zechstein, and the latter with the lower beds of the Jura formation. The dark slate with decomposing pyrites, which forms the banks of the river at Ovcharskaya derevnya (100 versts above Krasnoyarsk), would seem to belong to the same line of demarcation. There, as well as at Tomsk, and on the Aldan, between Yakutsk and Okhotsk, the clayey iron ore which adheres to the interstices of the slate is collected by the peasants, and sold as a valuable medicine in Krasnoyarsk.

The red marl which rises in stupendous walls on the left bank of the river below Krasnoyarsk, is described as extending horizontally under the surface

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of the country, as far northwards as the mouth of the Kem, in 58°·7. It is confined to the left side of the Yenisei as long at it runs eastward, but shows itself on both sides below the point where it sweeps to the northward. The wide extent of this formation proves that its strata must be horizontal, or at least very slightly inclined, and that it must belong to a period posterior to the elevation of the mountain ranges near Krasnoyarsk, as well as those seen upon the eastward of the river. A variety of clayey iron ore is found in roundish masses just below the surface, which are collected by the Russians and smelted in small ill-contrived furnaces, just as they are attempted to be reduced on the upper Tom by the Tatars, who have thence obtained the name of Kusnetsk or forging Tatars. Notwithstanding the defects of the process employed, the yearly produce of Yeniseisk was estimated by M. Stepànov at 30,000 poods of iron.

It is not till the Yenisei has passed within the polar circle that we find its bed enclosed on both sides within high walls of compact rock. I could procure no specimens of this rock in Krasnoyarsk, but from the description given of it by the traders who visit the fair of Turukhansk, it would seem to be a continuation of the peculiar limestone met with in the middle valley of the Lena. This picturesque district, to which M. Stepànov proposed to give the designation of Turukhanskiya voroti, or gates of Turukhansk, was represented by him as giving passage to the Yenisei through the former beds of two round lakes, which were connected together by a contraction of the valley, immediately under the polar circle. The limits of these lakes, as well as of the chasm which unites them, are defined by perpendicular walls of rock; to which not only their colour, but even the perpendicular as well as horizontal fissures in their strata, give such a delusive resemblance to

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an artificial piece of masonry, that one might fancy he could detect the fragments of columns and other gigantic architectural ornaments on the face of the precipice.

The stories I had heard in Tobolsk of burning mountains in the circle of Yeniseisk, proved to be nothing but dreaming tales, as I expected they would, when I reached the spot. With the refutation, however, came the correct explanation of the statement. The mists rising from the numerous springs on the mountain sides had been mistaken for smoke, a mistake often made even by experienced geologists in the case of real volcanoes. The luxuriance of vegetation, attributed to subterranean fires, is as easily accounted for by the warmth of the spring-water.

Culinary salt is one of the most important mineral productions of Yeniseisk, as well as of Tomsk. It is obtained from springs discharging themselves into lakes, like those in the steppe of Barabà. From the works of Troitsk, on the Usolka, about seventy versts west of the Yenisei, the supply is 40,000 poods during the winter season, April to September. The natural brine here is so rich in salt that the water is conveyed at once into the pans without evaporation in the air; so that the springs furnished 80,000 poods yearly till the demand was reduced in favour of the produce of the lakes of the circles of Achinsk and Minusinsk, where the process for obtaining it is less costly and slow. These extraordinary deposits of salt in Siberia, have been accounted for by geologists upon the theory of their having been formed in the bed of a sea, which has been dried up at some comparatively recent epoch. I shall have occasion, however, when I come to speak of the salt springs in the valley of the Lena, as well as the more northern lakes and springs on the Vilui, to record my dissent from such views; and shall only remark in this place,

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that there is no condition affecting the reservoirs in the government of Yeniseisk which is incompatible with a deep subterranean source. In the vicinity of Troitsk, for instance, there are several acidulous springs besides, in one of which analysis discovered nothing but carbonic acid gas, carbonate of iron, carbonate of lime, and resinous matter; in two others, the earthy matters were muriate of soda, muriate of lime, along with free carbonic acid, and the above-mentioned carbonates. It would appear from this, that though the contents of these springs are palpably not referable to the usual deposits of a sea, they are, on the contrary, readily accounted for by attributing them to the process which is ascertained to have given rise to the same waters in Europe.

Of the lakes in the government of Yeniseisk, there are two where the salt is deposited naturally, and three from which it is obtained by boiling. In the former, atmospheric evaporation alone is sufficient to precipitate the contents; but in the others, the solution is constantly fluid, though it acquires a thin incrustation of Glauber salt during the winter, or when the summers are dry. The most considerable of the "self-precipitating" lakes is the Stepnoe Ozero, or Desert Sea, on the eastern declivity of the mountain of Kusnetsk, five versts from the river Yus, an affluent of the Chulùim. Spontaneous crystallisation, and the consequent supply of salt, is said to have been interrupted in this lake from 1772 till 1812, when it recurred again with its former regularity. The precipitation is found to begin, in productive years, about the middle of June, when evaporation has reduced the depth of water from one arshine and three quarters to half an arshine. The precipitated muriate of soda rests, in a layer of an inch thick, upon a thinner stratum of sulphate of soda, or, as it is there called, busun. The salt obtained in this manner has

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amounted to 130,000 poods in a single season; it is partly stored in the neighbourhood, and partly conveyed to Achinsk for remote export.

The height of the Stepnoe Ozero above the present level of the sea, which must certainly exceed 1000 feet, and its situation in a district enclosed by steep granitic hills, is but little favourable to the forementioned hypothesis respecting the origin of the Siberian salt: the condition of the lake of Tagarsk, near the outlet of the river Lugazha into the Yenisei, is precisely similar, as well as that of three other salt lakes in the circle of Minusinsk, all of which lie adjacent to the valley of the latter river.

One of the most remarkable phenomena in the valley near Krasnoyarsk, is the absence of snow on the fields. The ice on the Yenisei affords a most beautiful and level road, while nothing but the naked earth, cracked and rugged from the frost, was to be seen on either side of the river. This state of things recurs every winter, so that the post-stations near Krasnoyarsk have the reputation of being the most arduous in Siberia. This must not be taken, however, as a proof that there is but little snow here; on the contrary, it is constantly present in the chasms that open into the main valley, and on the rocks by which it is enclosed, and is only swept away from the intermediate low grounds by violent storms. I have already described the frightful gale of westerly wind which we experienced at mid-day on the 26th of January. It seemed, notwithstanding, to make no impression upon the natives, who expect such blasts at every season of the year, and regularly at the same hour. In the summer months the streets of the city are swept by whirlwinds of sand, and in winter the deepest beds of snow are caught up by the violent and unceasing eddies of the storm, and leave no trace behind them. With all this, such commotions extend

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to a very trifling altitude; the atmosphere remains perfectly tranquil above, as I noticed on the day alluded to. Upon that occasion the rush of air must have occasioned a very evident diminution of the atmospheric pressure, unless the sphere of its influence was very circumscribed; but just then our barometer was at the normal height, as ascertained by observation for many days.

These periodic gusts are to be explained by reference to the peculiar formation of the valley. They are only drafts of wind upon a larger scale; for the masses of air, which lie between the parallel lines of cliffs, are completely screened from the morning sun. They consequently retain the temperature to which they had sunk during the night, but must pour themselves about mid-day down upon the open plain with an impetuosity proportionate to the clearness of the atmosphere, and the heat imparted to the dry fields surrounding Krasnoyarsk by the rays of the sun. It is thus, too, that, owing to local conditions, we observe a prevalence of west winds in this part of the valley of the Yenisei, though the prevalent winds in every other part of the open districts of Siberia are parallel to the meridian.

The rising of the Yenisei takes place twice a-year, as already remarked of the Irtuish at Tobolsk. The earlier occurs here about the 21st of May, and is distinguished as the snezhnitsa or snow-floods. This soon subsides, but after the interval of a month the river leaves its bed a second time, when the flood is denominated the Korennoi rasliv or pouring forth of the sources, as it is produced by the thawing of the snow upon the Sayanian mountains, in the circle of Minusinsk. Though this point is four degrees south of Krasnoyarsk no allowance need be made for that distance, for the current of the Yenisei, though at all times rapid, is so much accelerated now that the

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stones it tears up are often heard grating against the bottoms of the boats. It must, at the same time, be admitted, that the thaw sets in there thirty days later than at Krasnoyarsk; which is to be regarded rather as a proof of the height of those mountains, which are visible at a distance of 150 versts, and must consequently reach an elevation of 6000 feet above the level of the sea.

January 31st.—I left Krasnoyarsk about mid-day, and reached Kansk without halting. The first day was foggy, and far more uncomfortable to the feelings than the cold clear weather which returned after a twelve hours' fall of snow. The country was hilly, and generally covered with pine and fir till we had advanced towards Kansk, when the birch became predominant, but even this disappeared in the immediate vicinity. The villages are almost exclusively occupied by convicts, and every house may be said, in the words of the poet Rayevskyí to contain "one of the volumes of human fate." Calculation gives the yearly increase of population in the government of Yeniseisk by births at 1547, or $\frac{8}{1000}$, while that by convicts amounts to 3500. According to these data the numbers must double in thirty-four years, so that after a century more we shall have 1,235,000 square miles of territory inhabited by 956,000 individuals, more than the half of whom will consist of immigrants and their posterity.*

* M. Stepànov estimates the number banished to the several governments of Siberia, within the last nine years, at 12,500 souls annually. This source of increase, however, in the interval between 1796 and 1816, would appear to have been less: the return for the whole of the population in 1796, being 1,193,145; in 1816, 1,540,424. So that, if in these data we assume the excess of births over deaths at $\frac{5}{1000}$, as it is actually proved to be in the government of Yeniseisk, we shall reduce the number of these immigrants to 6540 a year. It is, at the same time, very probable, that in this period the principal portion of the recruits for the Russian army was drawn from the population of Siberia. The number of convicts, as at present reported in Yekatarinburg, is much below this. (Vol. I., p. 293).

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In this part of the government, too, particular attention is bestowed upon the roads. Railed bridges are constructed across the streams, and also over the marshes and ravines: the longest of these leads over the Poima, the swampy borders of which extend to a breadth of nearly three versts. The distances of the several post-stations are marked on posts, and in many of the villages are to be seen the pallisaded enclosures already noticed for the lodgment of passing convicts, and stables for the horses of the Kosaks, by whom they are guarded.

The importance of Kansk, as the chief town of a circle, is, as usual, shewn in the tasteful and modern architecture of the police office, and the wooden buildings connected with it. This title of distinction would seem, however, to be but little appreciated by the country people and waggoners, who still persist in styling the place the ostrog — garrison or fortress.

This evening we encountered a German woman in a poor peasant's house at Poiminsk. She was a native of Mittau, exiled, as she assured us, for a very trifling act of theft, and had here terminated her wanderings by marriage. In this, and in some other villages also, the farmer of the kabak or brandy-store was a Jew, who, like all others of his faith in Siberia, could speak German.

February 2.—The clearness of the sky and the serenity of the air gave a very cheering aspect to the fruitful landscape through which our drive passed, the dark pine forests alternating with smooth plains that glittered under their covering of snow in the vicinity of the towns. The temperature of the night had sunk to—28°·0, and even—30° R., but it rose again during the day to—10° in the shade, and nearly to thawing in the sun. Morning brought us to the flourishing settlement of Biriúsinsk, the frontier town of the government of Irkutsk, where we met the

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governor, M. Ivan Bogdanovitch Zeidler, who was returning with his family to Russia. As I had been provided in St. Petersburg with letters of recommendation to this experienced statesman, our meeting here might be considered as a fortunate event for me. This gentleman and his household had left Siberia with sincere regret; so that, strange as it may sound to European ears, our parting toast was, "a speedy return to Siberia!"

In this district, as well as in Eastern Siberia, the posting is under the direction of intendants appointed by the state, who reside at the most considerable stations. In all the others, the revenues, and everything else connected with this department, are in the hands of the starost or principal man of the commune, who has the control of the yamshchiks. The men, whose turn of service it is, are always to be found ready in the yamshchichnyi dom, which supplies the place of the usual post-house, differing in nothing but name from a common peasant's dwelling. At Alsalevsk, where I stopped to make an astronomical observation, our sledges were left standing in the road where the postillions had lighted a large fire to warm themselves, the blaze from which shot up above the neighbouring houses.

February 3. — During this night our road lay through a hilly district, in which the character of the geological constituents was concealed by the woods till, at ten o'clock in the morning, we came to a ridge of rocks running in a northerly direction. Our way then led down a very steep declivity, being bounded on both sides by high precipices of yellowish sandstone. This rock consists of beds of about a foot in thickness, which are either quite horizontal or but slightly inclined. At the bottom lies Nijnei Udinsk. The Uda here cuts its way through a broad level, bounded on the west by the range over

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which we had come, and on the east by a similar line of hills more remote from the river. The bright surface of the snow round the town looked just like a glittering sea enclosed within gently rising shores, and a circular belt of mountains in the back-ground.

Professor Hansteen, whom I overtook here, had passed through Nijnei Udinsk the day before, and from him I first learned that the cold of the preceding night had been more severe than any we had previously experienced in Siberia. Some quicksilver, which he had used in making an observation with his sextant, had frozen in a shallow saucer just under his window, and was found so in the morning. I had been so completely protected by my Ostyak dress, and a piece of voilok which I had thrown over the open part of my sledge, that I had never felt this excessive cold.

Forty-six versts more brought us to Slan, where we passed the night. The wide street of this town had a most picturesque appearance, lighted by the blazing fire which the yamshchiks had made. They remained in the open air ready for service, and not only waited upon us with their usual alacrity, but provided fresh horses for a courier who had just arrived on his journey from Irkutsk to St. Petersburg.

February 4. — My interview with M. Zeidler left me under the impression that my early arrival at Irkutsk was of more consequence than it afterwards turned out to be. I had learned from him that an Imperial corvette, on a voyage round the world, had left Cronstadt a little after my own departure; so that I thought it might be in my power to extend my journey to America, provided I could succeed in reaching the eastern coast of Kamchatka in the course of the year, so as to fall in with this ship. To effect this it would be necessary, not only to push on to Yakutsk before the rivers should become impassable

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from the melting of the snow, but even to cross the Aldan mountains to Okhotsk. The governor's opinion was that, if I used extraordinary despatch, I might yet be in time to find the snow-track good at Okhotsk, so that I might cross the northern end of the sea of Penjinsk with a dog-sledge and gain some point towards the middle of Kamchatka. But were I, on the other hand, to be surprised by the melting of the snow to the westward of Okhotsk, I should then lose all chance of reaching the coast for several months, and, consequently, of passing over to Kamchatka. Speed seemed therefore imperative. With this view I took leave of my Norwegian fellow-travellers at Slan, hoping to arrive in Irkutsk several days before them. Professor Hansteen still travelled in the European carriage, which I have already mentioned. It had been fixed on a sledge at Tobolsk, the fore-wheels being made a substitute for the otvodi or runners of the Russian sledge, and the hind-wheels secured to the back of the vehicle. The weight of this proved too great upon the hilly roads, for the Russian horses are not used to heavy loads, so that his progress was much slower than with the wooden tilegas of the country. Besides that, M. Hansteen used to pass the night at the stations, whereas I continued my journey. I also parted with my former attendant, the Esthonian, whom the Professor had hired in St. Petersburg. My separation from this faithful companion and participator of my previous toils left me in a thoughtful frame of mind, which would have amounted to anxiety had I had to do with any people less obliging and trustworthy than the Siberians. As to any assistance which I might require in my astronomical observations, I could command the services of a Kosak of Krasnoyarsk, whom M. Stepanov had directed to attend me to Irkutsk.

At the station Kursan, the second beyond Slan, we

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pursued our way, after having made a magnetical observation, through a country overgrown with trees.

The leafless trunks of the larches (listvenitsa), were here more tall and slender than I had ever observed them elsewhere. Forests of these trees, as well as of fir (*P. abies*), just ready to put forth their leaves, clothed the slopes of the surrounding hills, and generally the plains, too, wherever they were fully exposed to the winds; whereas we had only found them in the sheltered valleys of the government of Tomsk. This phenomenon was not so much owing to their southerly situation, as to the remarkable dryness of the atmosphere, which is peculiarly favourable to the growth of resinous trees; notwithstanding this, however, the birch continued to assert its predominant rights here, too, so that in some places nothing was to be seen, as far as the eye could reach, but the white stems of this truly Russian tree.

A story, handed down from the Mongolian aborigines, is still currently received here, to account for this striking distribution of the several species of forest trees. My Kosak's narration was to this effect: the Buraets (Bratskie) were forewarned of the coming of the Russians by a miraculous event. A growth of white trees—birch, had suddenly sprung up and displaced the black or pine forests, an omen that the swarthy natives would fall under the yoke of the fair Russians. This tradition is preserved even in the written chronicles of Siberia, and is further elucidated by a fact which I first became acquainted with among the Ostyaks of the Obi. In every instance where the linear-leaved genera of trees have been destroyed by fire, it has been remarked that they have been succeeded by those with expanded leaves. We may consequently presume, either that the Buraet soothsayers had predicted the approach of a second calamity from the actual occurrence of the first, or

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persuaded themselves after both events, that the latter had been prefigured in the former. Such a persuasion would be in perfect unison, moreover, with the notions of the Russians themselves, who are accustomed to distinguish their own people and their own sovereign from all others by the qualification of "white," as they do the birch from all other trees. At this day even, vieloi tsar, vieloi narod, vielaya Rus, are the favourite expressions applied in national poetry to their Emperor, their country, and their people.

February 5.—I crossed the boundary of the government of Irkutsk this morning, at the parochial village of Ontuisk, whence I had very foggy and cheerless weather to the station Salaria, where I took a magnetic observation. The results of investigations as to the intensity, went to show that the Siberian pole lay still to the eastward, as every step we moved in that direction gave evidence of an increase of magnetic force. Our route from Krasnoyarsk hither had already carried us 2°·5 to the southward, and yet the diminution of attractive power which we had reason to expect from that cause, was fully compensated by the easting we had made, which now amounted to 9°. The isodynamic lines, or those connecting places of equal intensity, had consequently a direction of S. 84° E. at this point.

These lines had already been observed taking an E. N. E. course in Germany, then tending nearly due east at St. Petersburg, next 36° E. of S. on the northern Obi, and now lastly verging into coincidence with the circles of terrestrial latitude, though still preserving a declination to the south. It was, hence, demonstrable, that the point of the maximum of intensity, or what is identical with it, the meridian of the Siberian magnetic pole, provided we had always continued upon the same circle of latitude, must

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be situate to the eastward both of Krasnoyarsk and Salaria.

We met to-day again several trains of sledges conveying tea from Irkutsk to Krasnoyarsk, attended some of them by drivers of strange aspect. These were Buraets, whose physiognomical characters are as distinct from those of the Russian as from any of the Turkish or Finnish countenances we had yet seen.

The streets and court-yards of all the villages on the road here, were quite covered over with balls of horse dung. These were expanded to such an extraordinary size by the frost, that they might almost be mistaken for the rounded stones left in the bed of a river. A new stratum of earth formed under such circumstances, would necessarily include a vast quantity of such koprolites.

The activity of the carrying trade, as well as the attention bestowed upen the breeding of cattle in Southern Siberia, is the primary cause of this phenomenon throughout the steppes; but the severity of the frost, and the rarity of snow in these parts, must also be taken into the account.

I stopped in the Russian village of Malta till the following morning, in order to pay a visit to the factories of Telma, which lie between this and the next station. An unusual degree of luxury was displayed in the post-house of this thriving town, the saloon of which was fitted up with several of the conveniences reckoned indispensable in European dwellings, while they afforded no little matter of pride to their Siberian possessors.

February 6.—Watch-houses for the Kosak pickets are erected at the south-entrance of Malta: the neatness of their construction reminds one of the vicinity of a government establishment.

A drive of nineteen versts brought us to Telma, situate on a grassy plain, in the middle of some

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thin birch woods. An even wooden causeway conducted us, between two rows of block-houses, to a church built of stone, in the Italian style, and ornamented with a cupola covered with green plates of metal. Barracks and guard-houses for the troops of the garrison established here, complete the principal street, and give the settlement an unusual air of elegance.

My admiration was still further increased upon approaching the factory itself, which is two stories in height, and is, beyond dispute, one of the most extensive and splendid buildings in northern Asia. The façade, of 364 feet in length, is adorned with massive columns, between which are two tiers of lofty windows of the clearest glass. The ground floor consists of three apartments, wherein all operations connected with the manufacture of the cloth are carried on; while the upper story is appropriated to offices and dwellings for the managers, by whom the institution is conducted at the expense of the state. Stone warehouses, and several smaller outhouses, occupy the bank of the stream which turns the wheels connected with the machinery. It is now a hundred years since the natural advantages of this place were first turned to various manufacturing purposes by private speculators. The manufacture of cloth was originally one of the principal branches of its activity, and is still in a flourishing state. There have been lately erected a linen factory, a paper-mill, and glass-house.

The population is 2000, whereof 800 are employed in manufactures. They are all convicts, the propriety of whose behaviour leaves nothing to desire now that they are placed in a condition of comfort and security. Like the free artisans of the Ural, they are supplied with rations of flour; besides which, every male receives a certain amount of

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monthly wages, of six to fifty roobles, according to the nature of his occupation. Women can earn from two and a half to five roobles at weaving linen, or in the prepartion of the material.

The wool employed is purchased from the nomadic Buraets and Tunguzes, who keep their flocks in the neighbouring governments, and in the island of Olkhon in lake Baikal. The combing and spinning-machines are upon the most recent English principles, models having been procured from Europe for their construction, as they can be made by the Siberian peasants at a fifth of the original cost. The deliveries of cloth amount to 62,000 arshines yearly, 12,000 of which are expended upon the miners of Irkutsk, the soldiers, and Kosaks: the remainder is disposed of for the account of the establishment, at an average price of three roobles the arshine (twenty-eight inches). This cheapness is owing to the competition of the Siberians, who can supply karaseya — cloth of unbleached dark-coloured wool, such as is worn by the peasantry — at two roobles the arshine. The wool of the Buraet sheep reared on the steppes, is said to be ill-adapted for the production of the finer cloths; though it is the opinion of M. Protopopov, one of the most active and intelligent of the managers, that much more might be done in this department but for the unreasonable prejudices which exist among the higher orders in Siberia, as well as in Europe, in favour of foreign commodities. An attempt was made, many years ago, to improve the Buraet sheep by a cross with other kinds; a plan which, as I have since learned, has been successfully carried out in 1830. A flock of 480 Spanish sheep was despatched from Moscow to Irkutsk, of which, notwithstanding the length of the journey, and exposure to the Siberian pestilence in the steppe of Barabà, 300 arrived safely at their destination. Government is thus provided with the means of pro-

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ducing every possible variety of breed, from the argali — the northern parent stock, to the merino, which is supposed to owe its celebrity to a cross between the meager Spanish sheep and the southern species of the wild sheep, or *Ovis musimon*, still existing in the islands of Corsica and Sardinia.* The question might well be asked here, how they came to overlook the mouflon (*O. musimon*) inhabiting the mountains eastward of the Caspian Sea, which is of the same species, and more likely to thrive under the climate of Siberia.

The glass-house at Telma gives employment to thirty men at three melting furnaces. Nearly every description of vessel is made here of crystal glass, which is afterwards elegantly and tasteful cut by lathes, put in motion by water-wheels. The potash required is obtained on the spot †, and the quartz-sand is found near Nijnei Udinsk, and is, very probably, supplied by the sandstone formations of the district. I had an irrefragable proof of the punctuality with which the most trifling orders are executed at Telma, in the instance of ten barometer tubes which Mr. Protopopov had blown at my request, and which fitted with the greatest nicety into the mountings for which they were intended. I

* The Spanish sheep were black, with a coarse and very inferior wool, till the Roman colonists settled there, and introduced a taste for rural pursuits. Marcus Columella was the first to notice the wild Mouflons, at Cadiz, which were on their way from Africa to the arena at Rome, and which he afterwards used for the improvement of the Spanish breed.

† The preparation of potash from birch-wood, has been an important occupation for ages in Russia. Of this we have an example in the names given to the months in ancient Slavonian, which have been displaced by the mutilated Latin appellation Yenvàr, Fevràl, Noyàbr, &c. The primitive Russian for April, is Beresosol — birch-ashes, in reference to the months appropriated to this task, just as Chervets, from cherve, an insect or worm, denotes the time for gathering the cochineal — in June. The use of wood-ashes in washing has been noticed in a former page, Vol. I., p. 148.

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received them some days after my arrival at Irkutsk; and, notwithstanding innumerable mishaps, I was thereby enabled to continue my barometrical measurements to Kamchatka.

Forty looms produce 30,000 arshines of linen every year. Hemp is grown in the government of Yeniseisk, and is either bought in raw, and spun in the factory, or collected in the state of yarn from the housewives of Telma. The yarn is washed in a lye of wood-ashes, and the linen is bleached upon the snow in spring, or upon the meadows which surround the town in summer.

The stream which gives motion to the machinery was, even at this season, perfectly free from ice, running with a rapid current and considerable fall. It enters the Angara just below, but has its rise in a mountain on the west, which is known by the name of the Baikal, though it is not near the lake. The assertion of M. Protopopov, that this stream is never frozen even in the hardest winter, seemed borne out by actual circumstances; for the temperature could hardly be expected to be ever lower than it had been during the last days of the preceding month. On this account it would have been so much the more desirable to be able to examine the springs in this neighbourhood; but I found it impossible to test any but the surface-water obtained near the factory from a depth of only twenty-eight feet. This water showed a temperature of $+1°{\cdot}7$ R. just as it left the pump, but still it had evidently suffered a great reduction of its primary heat by contact with the crust of ice with which the inner surface of the pump was covered.

The distance from Telma to Irkutsk is estimated at 56 versts, which we made with our good horses in five hours. The road lies through a splendid forest of pines, firs, and larches, in which we saw a number of speckled buntings (*Emberiza nivalis*), that flew close

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to our sledges. They are called snyegiri, or snow-buntings, here; but the name by which they are more known in European Russia is podorozhnik, or road-birds, as indicative of the boldness with which these pretty creatures seek their food during the winter, almost under the feet of the traveller's horses. We were continually meeting long trains of one-horse sledges, all laden with tea, packed in round bales covered with goat skins, and secured by a sort of netting on these vehicles. The Buraets, by whom they were attended, were men of robust and compact frame, strikingly characterised by their brown complexion, small eyes, taking an extraordinarily oblique direction upwards from the nose, and cheek-bones projecting forwards and outwards far beyond the rest of the face.

Notwithstanding our increasing impatience to reach the long-wished for city, we found it impossible to evade an interruption occasioned by the exercise of Siberian hospitality at our last stage. We unexpectedly found ourselves in a most incongruous assembly at the Volostnui dom, or little court-house of the village. A child had just been baptised, and at the same time an investigation had been held, respecting the death of a person whose body had been discovered near the town. After the inquiry had terminated, the witnesses who had given their evidence as to the supposed murder, the sponsors for the child, and the priest himself, and several accidental droppers-in, had gathered over some capital home-made wine. As for us, we were immediately welcomed with full glasses, and found it difficult to disengage ourselves from our new and excited friends, even after we had emptied several goblets to the health of our entertainers.

On the other side of this village we had the first view of the Angara. Perpendicular walls of rock stretch along the right bank of a wide river, which,

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even when frozen up, affords indubitable evidence of the violence of its current. Jagged masses of ice appear, partly bursting though the smooth expanse in which they are imbedded, and partly still forming the confused piles in which they were deposited before the stream was arrested by the frost. The emerald-green hues and rugged and picturesque forms of these blocks of ice, continued to attract our eyes till we reached the entrance to the city.

I now found myself disappointed in one of my expectations, namely, that the attendants at the toll-gates would recognise one of their fellow-townsmen by the name by which he was known to the learned of Europe. Of M. Hess, whose chemical and geognostic acquirements are well known throughout Germany and France, I could obtain no information whatsoever till a Kosak, who was accidentally passing, contrived to make them understand that it was Herman Ivanitsh, the doctor in the governor's house, that I meant. This man undertook to conduct us to the doctor's apartments, where, though the occupant was absent, there was still enough to verify the assertion of our guide in some numbers of the *Annales de Chemie*, which could hardly have had any other owner in Northern Asia.

Congeniality of pursuits soon put me on a friendly footing with the German chemist, who made himself equally agreeable as the Siberian host. He gave me an introduction to the family of a citizen of Irkutsk, who received me into his house, and I found myself on the following day in the full enjoyment of the comforts of my new home.

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CHAP. VIII.

CHANGE OF PLANS.—CLEAR ATMOSPHERE AT IRKUTSK.—BRILLIANT LIGHT. — ELEVATION OF THE PLACE. — PECULIARITIES OF THE CLIMATE. — THE BUILDINGS OF THE TOWN.—THE BURAETS.—OX WAGGONS. — DRESS. — THE MARKET PLACE. — PRICE OF MEAT. — THE BAZAAR. — MANNERS OF THE PEOPLE. — BUTTER-WEEK. — RUSSIAN SLIDES.—TREATMENT OF EXILES.—SYSTEM OF GOVERNMENT.—SHIPPING ON LAKE BAIKAL.—DANGERS OF THAT SEA.—ROAD ROUND THE LAKE.—MOUNTAINS.—TEMPERATURE OF THE SPRINGS.—VEGETABLE PRODUCTIONS.

My previous intention of taking a hasty departure for Kamchatka was given up as injudicious, in consequence of some further inquiries which I made in Irkutsk. I was informed here, by M. Lutkovskyi, a retired naval officer, that vessels touching at the port of Peter-and-Paul, on a voyage round the world, are accustomed to lie there till the arrival of the last mails for the year, which never reach Okhotsk till August or September, when they are forwarded by ship to the peninsula. Now, the last dog-post leaves Okhotsk as early as February, so that there was no chance of my being able to proceed in that way; but, on the other hand, there was no question of my being able to reach the east coast by the winter passage, were I not to start from Irkutsk even till after the first thaws, as the spring is so much later in the valley of the Lena and on the Aldan mountains than here. The consequence of this information was, that I spent the interval, between the 17th of February and the 19th of March, partly in the capital of Eastern Siberia and partly on a journey to Kiakhta, which unexpectedly enough I performed in company

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with my two former fellow-travellers, Professor Hansteen and Lieutenant Due.

The exterior of Irkutsk, and the mode of life of its inhabitants, are in the highest degree attractive and delightful, far removed from leaving any impression of the stoical self-denial, which is one of the obvious characteristics of Tomsk, Tobolsk, and other cities of Western Siberia. During my entire stay, the sky may be said to have been without a single cloud, its colour being of the deepest blue; while the air seemed to possess that peculiar degree of purity which we can expect to enjoy in Germany only during the finest part of the month of May. For depth of colouring, the sky in the vicinity of Irkutsk may well compare with the region of the trade-winds. In the beginning of February, the temperature of the mornings was frequently — 23° R., and at the end of this month — 15°: still so bright and cheering were the rays of the sun, that we were deluded from day to day with the idea of its being the beginning of spring. The temperature, too, was almost invariably raised to — 4° at mid-day in the shade; and there rarely passed a day after the commencement of March when it did not thaw in the sun. And so far was I from suffering from a degree of cold, which I had hardly ever been exposed to before, that I felt no reluctance to exchange my Ostyak dress for a cloth frock and a mantle lined merely with hare-skin. The streets were much more free from snow than in other parts of Siberia, and the wooden foot-ways near the houses were completely clear of it. The brightness of the atmosphere gave a most delightful clearness to the landscape, and lent unusual sharpness and distinctness to distant objects and colours. I often found myself deceived in Irkutsk as to the colour of the peoples' dresses and similar objects, which I constantly supposed more splendid at a distance than I

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really found them on a nearer view. Literally speaking, every thing appeared in the most cheering light.

The immediate cause of this, as well as of many other climatic peculiarities of the country, is the unusual dryness of the air, which is again referable partly to the remoteness of its situation from the sea coast, and partly, and perhaps more justly, to the elevation of the adjacent districts on the south. Irkutsk is, by my calculation, 1237 feet above the sea*, so that on this account alone we might expect a very sensible rarefaction of the vapours as they ascend above its level. Upon an isolated hill this effect would be rendered less apparent, by the constant afflux of the heavier vapours from the contiguous plains, by which a greater diffusion of moisture would be maintained. Here, on the contrary, no such compensatory process can take place. The southerly winds, which in every other point of our hemisphere are damp, and which are moreover the prevailing winds at Irkutsk, not only during five consecutive months, but on the average of the year, are there completely exhausted of humidity by the desert tracts over which they blow.†

For the first 140 miles towards the Chinese frontier, the country rises gradually 975 feet above Irkutsk. Then follows a more rapid ascent for 170 miles to the southward, as far as Urga in Mongolia, till, lastly, the 3187 feet gained is continued, without variation, for 390 miles more, till we strike the boundary of the parched desert of Gobi. The steep southern slope of this table-land terminates near the city of Yan-dsya-keu, situate on the route to Pekin, in 42° of north latitude. A stretch of territory thus

* The barometer stood there at 28·66 inches from the 16th of February to the 22d of April.

† In January, February, July, August, and November, the S.S.E. is the prevailing wind; in the other months the N.N.W.: but, in intensity, the latter is far exceeded by the former.

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maintaining an elevation equivalent to the Brocken for 360 miles, and with a slope of 320 more towards Irkutsk, may well be presumed to exert considerable influence on the surrounding region; especially when we also take into consideration that the Mongolian steppe beyond has an extent of 20 degrees of longitude, or of more than 800 geographical miles. The earlier Russian envoys, who followed the route from the Irtuish to Pekin, were as much surprised at the appearance of the northern slope of the Gobi, near the sources of that river, as the later ones at Urga. The climate of Irkutsk has an interesting counterpart in that of Canton, as represented by Dobell and other travellers. What the south winds are to Irkutsk the north winds are to Canton. They begin in October, and are attended with such aridity of the atmosphere, that all the floors and other woodwork of the houses are warped and split by them, even when the doors are kept shut. Packages of tea must never be closed before the setting in of the north wind, and the lustre and delicacy of colouring upon Chinese wares is perhaps justly ascribed to the rapid drying of the paint during the autumnal months. At that season there is no supply of vapour from the ocean for Canton, no more than there is for Irkutsk from the Baikal, which sheds its humidity on the adjacent mountains.

Irkutsk lies in a plain consisting partly of fine rubble and partly of a dry and fruitful bed of clay. Ranges of well wooded hills rise on the east and north-east, over which goes the road to the sources of the Lena. The stream called the Ushakovka falls westward from these hills, and pours its waters into the Angara after traversing a part of the city. This latter is here about 1000 feet in width, and receives the Irkut from the left, which, as well as the water of Telma, descends from the Baikal mountains. The Exchange, built of stone, and a long line of wooden

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houses, occupy the bank of the main river down to the mouth of the Ushakovka, and are surrounded by a grove of stately poplars and pines. To these succeed, on the opposite side of the stream, the handsome offices of the Admiralty with their dockyards on the Angara; further westward is the site of the factories and Government workshops, in which the newly-arrived convicts are employed. All the principal streets run parallel with the river: the houses are all neatly planked, and painted yellow or light grey. Every thing here is more pleasing to the eye, and more tasteful and expensive in its decorations than in Tobolsk. Kitchen gardens are common at the rear of the houses. The streets are not paved, but kept in as good order as the wooden causeways provided for foot-passengers. In spite of its flourishing condition buildings of masonry are still the exception in Irkutsk, for of 1900 dwellings only 50 are of brick; half of these belong to rich merchants or citizens who have learned to abandon native usages, and possibly real comforts too, in favour of modern luxury; for it is a universal opinion here that wood is a much better protection against the cold than stone. I may state with regard to the School of Medicine, the Gymnasium, and the offices of the American company, that they would be considered spacious and ornamental in any city of Europe. The chief ornament however, of the city, is a noble quadrangular parade in its centre. On one side of this are built the residences of the governor and other public officers, and on the other a guard-house. The whole has altogether a modern and European air, especially on the morning of a festival, when there is a muster of the four companies of infantry stationed in Irkutsk. Here I had the agreeable surprise of hearing German music for the first time since I left Tobolsk, and the last till I stood upon the eastern coast of Kamchatka. Pieces from

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the Yungfernkranz and Der Freischütz were played as the troops marched by, and had now a fair chance of becoming popular among the Chinese.

Our vicinity to the Celestial Empire could hardly be forgotten in presence of the Buraets, who are closely allied to the natives of the northern provinces of China in language and customs, and by whose victorious ancestors many usages were imposed upon their southern neighbours, which are now supposed exclusively characteristic of the Chinese. Numbers of them came down to the city every day from the mountains. Their winter traffic is in hay, or peltry obtained with the bow. They brought the hay in waggons drawn by oxen, which I had never seen in Siberia before. Many came on horseback. They wear their hair in a long tuft, partly covered with a hat made of black sheep-skin running into a cone above the head, and having long flaps of the same material, which they can draw over the sides and back of the head. The mantle of the poorer sort is also of skins, with the hair inwards; but the richer and more respectable class always wear it of cloth, but similar in fashion. It is a sort of cloak with sleeves, the two front parts of which wrap one over the other on the breast, so that the upper flap lies on the left shoulder. The edges of this wrapper, as well as the shoulders and back, are always faced with fur or stripes of red cloth, which gives an appearance of civilization and even elegance to the poorest. Every one carries his smoking apparatus at his girdle, and his tea-cup projecting under the breast of his jerkin.

The markets on the Angara presented an attractive and lively scene. Russian women and dealers were seen forcing their way through a motley crowd of Buraets, and all addressing one another in Mongolian, which is here already a living tongue. Fish, flesh, meal, and other necessaries, are exposed in wooden

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booths. The meat row, myasnoi ryad, was an exact counterpart of the German shambles in externals; the joints were hung on hooks before the stalls, and cut up on large blocks with the cleaver. The store of animal food was enormous, that is, during the early part of our sojourn, but was destined to be exhausted by purchasers before the beginning of the fast. The supplies of beef are drawn, to a small extent, from the herds of the Buraets, but principally from the Russians of Yeniseisk. The cattle are driven in alive. Beef was to be had in the city at two and three roobles the pood, or about a halfpenny a pound; but of bread-meal, which is likewise sold by weight, one penny would purchase nearly eight and a half pounds. Partridges and kuropatki I have bought myself at five farthings each; fish, both salt and fresh, was offered for sale in astonishing abundance.

The Gostinoi dvor proper is in the immediate vicinity of these markets. It is constructed of stone, with the usual porticoes and rows of shops, which are plentifully furnished with articles of Chinese and European manufacture. There is no such systematic distinction made here, as to the objects in which the traders deal, as we find observed in Russia; all the warehouses are supplied with tea and cloth from the the mart of Kiakhta, and all other sorts of European goods in demand at Irkutsk are obtained at Makariev in exchange for these products.

This facility of communication evidently has its influence upon the population. The lower classes show a much greater disposition to avail themselves of the comforts of life, and to adopt a certain refinement of manners, than is met with in other Siberian cities. As these remarks are more peculiarly applicable to the family in which I was domiciled, I must be pardoned if I bestow a few words upon my amiable hosts, their visitors, and friends. They belonged to

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the starozhilie or ancient settlers. Some of the male branches were Kosaks, while the rest were engaged in those indefinable pursuits of the citizens of Irkutsk, which cannot exactly entitle them to be designated as tradespeople or regular merchants. They were at once dealers in cloth and linen, contractors (podryadi), and travelling merchants. In terms, the Russian meshchanin is taken as equivalent to the German burgher (bürger); in point of fact they are utterly opposed. The Siberian is by profession the most unsettled, and the German the most settled of civilized men. Here it is a frequent occurrence that they should have passed their early life as Kosaks, at which period they learn to behave *molodetski**; they then become *molodtsui*, a term, in popular usage, indicative of the highest degree of social worth. According to the vulgar creed, this is a title to which the plodding trader in the Gostinoi dvor can never assert a claim, though it is within the reach of every other Russian, whatever be his rank or age. Heard from the lips of a commander, this word acts with magic power upon the men he is leading to the cannon's mouth; and I have even heard the ejaculation of *Akh molodèts* from some poór sailors to the Emperor, whose presence seemed to requite them for wounds and hardships. Molodèts is the expression used by a Kosak to his horse, and even by the hunter to a bear when he means to applaud his mettle. The appropriate banquet for the molodèts of the ancient legend is the ox, which is represented as ready roasted and garnished with spices on the top of a mountain in their fabulous realm. The popular hero is often styled the molodèts molodtsòm, or lad of lads, who can "creep in at one ear and out at the other, with whomsoever he

* This is the adverb from molodèts, which means, literally, a young man; Pl. molodtsui (Russ.).

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may speak:" in fact, a finished Russian politician. Before a Kamchadale, a Tunguze, or an Ostyak, has travelled three days in company with Russians, we may be sure that he has caught up the import of this magic name, and is already possessed with the ambition of deserving it. To the ordinary etymologist, molodèts may seem to convey no idea beyond that of a young man, but to the imaginative it represents one endowed with eternal youth, and in word and deed pre-eminent for energy and courage. Such is the term by which the natives of Irkutsk endeavour to express that ideal model of intellectual superiority which is the object of Russian admiration. Well may it be said that this country is still in its youth, and hence that the characteristics of its condition are justly associated with an idea of that state.

Many of the natives, however, appear to reserve the exercise of these qualities for the season of travel, while at home they indulge themselves in all manner of gratifications. Their constant advice to me was to do the same; for, according to their adage, "The road to teach, the stove to comfort."

Our house consisted of one range of building, raised about eight feet above the ground, containing five or six rooms, divided by a gallery into two rows. This was entered from the yard by a covered staircase, under which was the entrance to an apartment, partly underground, very dark but very warm. Here our host was to be found, during the day, with his friends. The samavar was in incessant requisition; their tea was good, and their remarks on matters of trade and speculation tedious and satisfactory. It was only at our well supplied dinner table that there was a general muster in an upper room, usually occupied by the women and children. Towards evening this same apartment was heated like a bath, and here

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the whole family passed the night together, on cushions laid upon the floor, and covered with a single light quilt. But there was a bedstead in the house, a rare occurrence in Russia. It stood in a chamber near the street, along with the images of their saints; and this was appropriated to my use.

The females of Irkutsk are very often graceful in form and agreeable in their looks. A strange physiognomical contrast, however, is observable between those in whom the Russian blood is pure, and those in whom it has been contaminated by intermarriage with the Buraets. In the former the colour of the skin is exceedingly fair, the figure plump, and rather inclined to corpulency, even in early life. The latter are spare and muscular, with a complexion of a swarthy brown. We had already remarked an analogous diversity in Tara, where we found it difficult to adjudge the prize of beauty, whether to the blond Russian beauties, as represented by the daughters of M. Philemonov, or to those claimants on the part of the brunettes whose physiognomies betrayed their affinity with the Kalmuk race. A fair complexion is designated in Eastern Siberia by a local and, hitherto, inexplicable term — maganui. It is from the women of Siberia that these obsolete, or provincial expressions, by which the genuine Siberian is distinguished from the European Russian, can best be learned. Several of them, as well as the tone of voice peculiar to the place, convey an idea of gentleness and repose. The adverbs divno and shipko — wonderfully and excessively,— little used in Russia, have gained an extraordinary preponderance here, so as to have almost dispossessed the Slavonian comparative form; odnako, too, as a modest, qualifying particle, yet, notwithstanding, is in very constant use. But in Kamchatka it is to be found in every sentence almost, where it gives conversation a tone of pyrrhonism. No

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less striking is the courteous demeanour of even the lowest orders towards each other. Citizens' daughters rarely address their female relatives by their names, but as madam, my dear, my love; adding, then, the name of the person accosted, with the Christian name of the father. The privileged classes in European Russia assert, that the patronymic suffix *vich* is their exclusive right; in which they may be justified, as far as they are of Norman descent, as it is possible that it was in this manner that the French *fils* found its way into Russia after its transformation into the Irish *fitz*. The lower orders are consequently obliged to adopt the adjective form, as ivànov, vasiliev, derived from the paternal name, or affix the syllable suin to it. In Irkutsk, on the contrary, every one gives his relatives that much prized appellative, fully aware of the respect it implies; so that the ordinary Russian mode of inquiring the patronymic of a new acquaintance, kak vas velichayut — how do they exalt you, sounds quite obsolete here. Every one in company is immediately complimented with cousin, father, &c.; nor is there any part of the world where they are more liberal in their terms of endearment to children. Sakharinochka — my little lump of sugar, carries its own significance with it; not so loskutochik — my little clout, which is used, though not so frequently, with the same intention. One of the elder daughters, or other relation, for whom the Siberians have also invented a distinctive name — vodnya, seemingly from vodit, to lead or guide, is commonly intrusted exclusively with the care of the children. I was equally struck with the proverbial allusions by which the duennas of Irkutsk describe the expected suitors to their fair young friends — he drinks no brandy, takes no snuff, and utters no blasphemous oaths. This last qualification will hardly be found to hold good either in Russia or Siberia, as

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far as my experience goes; so that the rest of the commendation may, possibly, be pure invention too. I feel myself bound to observe, on the other hand, that I never saw a drunken person in Irkutsk, even on a holiday. But a result of the frequent dancings, and other amusements in which the younger Siberians indulge, is, that they are excessively liberal with their kisses. Whatever familiarities may be permitted between the sexes, the only scruple by which the young women are infallibly controlled, is a superstitious dread of being alone with their lovers in the presence of the holy images. Conscientious difficulties of this kind, however, are frequently obviated by putting these witnesses behind a curtain.

The strict fast of six weeks, by which the members of the Greek church prepare themselves for the feast of Easter, began this year on the 14th of March. The ten days immediately preceding, constitute the maslinitsa or butter-week, as it is called, during which also meat is forbidden. According to established usage, this is the season for revelling in all sorts of dishes that can be invented of butter, milk, and eggs; which are consequently as indispensable to the maslinitsa as the diversion of the sliding parties. In this city the earlier part of the day is devoted to mutual visitings, at which cakes called blinnui are invariably introduced. They are of a flat shape, and made of rye-flour, which is set to ferment in a moderate heat, from mid-day till the following morning; they are then baked in a pan, but so that nothing more than the outside is crisp, while the inside is moist and spongy. To be hot is a necessary condition in the case of blinnui, for it is only in this state that they are considered a delicacy. They ought, likewise, to be completely saturated with butter; though milk and boiled eggs may be used instead of this.

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In the latter part of the day the rendezvous of the inhabitants was their splendid Russian slide upon the Angara, which had been completed some days before the feast. This is a sort of scaffolding of about 30 feet in height, down which they shoot in sledges along a rapid slope of artificial ice. The ice on the river formed a continuation of the line, and the entire mount was decorated on each side with green boughs of fir, and hung with lanterns of coloured paper in the Chinese fashion. The sledges, which are made of a single plank fixed upon two wooden runners, are so low that a person sitting in them can reach the surface of the slide with his hands. He bends himself backwards, stretches his arms out behind, and thus steers himself safely down with his hands, which are protected by a pair of stout gloves. The longer the amusement lasts the more venturous is the sport, and the more frequent the mishaps; which are borne and laughed at with equal good humour by men and women. A simple board, or even a piece of hide, is often used instead of a sledge; and some will even run down on their feet. Similar mounts are formed even in the courtyards of the houses near the river, with which a communication is effected by covering the ground with sheets of ice, rendered even and smooth by pouring water over them.

The respectable condition, in which we found the population of Irkutsk, was the more gratifying when we came to consider that many members of it were the descendants of criminals who, in other countries, would have suffered the punishment of death or of incarceration, which might be more terrible still. The criminals, as soon as they arrive, are provided with certain rations and clothing, for which they are forced to work in the Penitentiary, and sometimes in the woollen factory, which is the property of the Government. I have upon many occasions visited the work-

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shops of the curriers, smiths, carpenters, and turners, which are in a spacious building on the Ushakovka, and have always found them in excellent order, and occupied by healthy and cheerful-looking artisans. Orders for work are addressed to the officers, but all further directions and details are given to the men themselves, either in the factory or during the hours of rest in the lodgings of the convicts, who form, with their families, a large proportion of the inhabitants of the northern suburb. Women and children have employment given them too, and their earnings are accounted for as at Telma. The new comers take the places of the older in the town, so that the latter have then more time to employ for their own benefit, till they are at last admitted to all the privileges of free citizens. One of the convicts, who was in this state of transition, had applied his leisure hours to the making of barrel-organs. The mechanical talents of this man, however, were capable of a much wider range: with his assistance I completed several barometers from the tubes I had got at Telma, for I had a scale which was graduated at Paris, and found distilled quicksilver in the laboratory at Irkutsk.

Notwihstanding the national peculiarities of Siberia which distinguish the lower classes, the manners of the upper ranks in Irkutsk are perfectly European. First among these stands the family of M. Muraviev, the provost of the town, who, though at present in that subordinate post, served with distinction in the campaigns of the Russian army in 1813 and 1814. He accompanied General Chernichev, the Hetman of the Kosaks, to Paris, where he filled an office very similar to that with which he was now invested upon the frontier of China. I have hardly ever met with any one in whom personal advantages and the most dignified manners were united with such an irresistible expression of gentleness and sensibility—

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the very qualities that had exercised the most disastrous influence over his fortunes. Intercourse with the officers of the German armies had inspired him, as well as many others, with the prevailing enthusiasm in favour of nationality and freedom, and induced him to establish societies in Russia upon the model of the German Tugendbund, the result of which was to give an apparent sanction to those political cabals by which the stability of the Government was threatened in 1826. At the outbreak of the commotion, as his connection with the conspirators seemed to have no further existence than in name, a milder punishment was awarded to him than to his relatives, the brothers Muraviev Apóstol, and many of their friends. He was banished to Selenginsk, where he lived for some time in poverty among the half-Mongol natives, till he was appointed to his present situation as an earnest of his gradual readmission into favour. Yet still he was obliged to receive all his remittances and letters through the hands of the governor, though himself at the head of the municipal police. Madame Muraviev and one of her sisters, though connected with some of the richest of the princely families of Southern Russia, had affectionately shared his exile, and now gave lustre to the humbler circle in which they moved. As an instance of their intelligence and unusual devotion to natural science, I may mention their curiosity to know the fate of Fresnel's theory as to the radiation of light. But with all this mental cultivation, the most truly charming characteristic of these amiable ladies, was their genuine sympathy with every thing relating to the nationality of which they had been the martyrs. From none did I ever hear a more just appreciation of Siberian character. Their representation of the pantomimic dances, with which the natives accompany their songs, was given with such impressive grace as to surpass

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every performance that I had hitherto witnessed in Russia.

The most distinguished cultivators of science in Irkutsk were to be found in this society; MM. Chukin, Anthropov, and Julianin, who had studied in Kasan, and held professorships in the gymnasium; M. Igumnov, who was born in a village near Kiakhta, and had learned Mongolian as a second mother-tongue among the Buraets. His active services were divided between the state (for he filled the post of Government-interpreter) and scientific research, which he pursued even in his advanced years with unabated enthusiasm. He was just then engaged upon a comparative dictionary of the Mongolian and Sanscrit languages, and a translation of the Russian catechism into Buraetish. His other exertions in the cause of civilization will come under our notice upon a future occasion. MM. Kavalevskyi and Popov, two zealous young students from the university of Kasan, had come to put themselves under his tuition, for the purpose of acquiring the Mongolian and Chinese languages; while M. Turchaninov from St. Petersburg, was occupied with the Flora; MM. Hess, Spheridov, Philatiev, Theremin, and others, devoted their attention to the mineral productions of the surrounding districts.

This enlightened circle included merely such of the civil and military officers of the Siberian capital as belonged to the last generation, who, having spent their youth in the Lyceum at Odessa, or in some of the most distinguished of the educational establishments in Russia, were consequently well calculated to exercise a beneficial influence upon the condition of society in Siberia. This new generation of public servants had, both from early social intercourse and the philosophic turn of their minds, adopted a more enlightened view of the people and their actual condition, and had begun to evince the most laudable

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sympathy with the primitive and unsophisticated character of the Siberians.

It was in company with one of these gentlemen that I encountered a person, in the prime of life, who resided in the country, and who came to visit or transact business in Irkutsk only in the evening. He wore a caftan, very little superior to that of an ordinary peasant, and came up to his friend to show him a bank note for five roobles which he had just earned. It was easy to see that he was a European, and yet I felt surprised, upon making some allusion to his former rank and fortunes, when I heard him repeat, with a Slavonian accent, half-jestingly and half-significantly, a quatrain of Werner's.

He then told me that his name was Rayevskyi, and that he had been a colonel of artillery, but had been exiled to Siberia, during the commotions of 1826, for having encouraged the dissemination of liberal opinions in a military school of which he was the principal. It is a striking fact, that most of the participators in the last Russian revolution, were men of poetic talent. M. Rayevskyi spoke with admiration of Zacharias Werner, whom he had known in early youth in Warsaw, and from whose compositions he still drew no less consolation than intellectual refinement.

This man had learned to regard even his present position with a philanthropic eye. The Russian peasantry, among whom he had fixed his abode, were of the sect of the Dukhobortsi, or Champions of the Holy Ghost; a denomination under which they had formed a secession in Southern Russia, about the period of the reformation of the church in Germany. They admit no written religious code, and elect only those to the sacerdotal office who feel themselves called and set apart for it. They likewise refuse to bear arms, and regard marriage merely as a civil

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obligation. Several of them had suffered cruel persecutions from their former rulers, and had even died as martyrs, till it was at last found advisable to offer these obstinate schismatics the alternative of a refuge in the vicinity of Irkutsk. It is asserted that they were formally entreated by the Emperor Alexander to make a public declaration of their religious conformity, preparatory to their reinstatement in their former homes; but though this magnanimity failed to produce its effect, that he had nevertheless forborne any interference with their social rights, in consequence of their acknowledged loyalty and integrity. Of the patriarchal simplicity of these people M. Rayevskyi spoke with the greatest energy and admiration. He himself had been adopted by one of the elders of the community, who had even proposed to give him his own daughter in marriage; and he was now established among them as Podryadchik in negotiating between the peasants and the merchants for the hire of horses.

M. F., another of these exiles, had been degraded for striking a superior officer, and now held a subordinate appointment in one of the military schools. His memory was a copious repertory, especially of facts connected with the French campaign, which he had made when only sixteen. He bore the privations of his lot with stoical fortitude, and was still addressed by his friends as the baron.

The "unfortunates" of the fourteenth of December, who had been condemned to hard labour, were confined to the settlement of Chità, which lies beyond the Baikal, on the road from Verkhnei Udinsk to Nerchinsk. There are no mines there, so that in order to carry out the sentence of the convicts to the letter, they have erected a polishing mill in which to employ them. It speaks much for the leniency of the Government or its servants, that these unfor-

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tunates have a library for their own use, and that of their families who have followed them. I saw some volumes of Schiller's works in Irkutsk, which had been borrowed from their collection.

Other restless spirits, belonging to this category, whose punishment had been been limited to mere deportation, had settled in Beresov, or in the valley of the Lena, or in Yakutsk. One of them from Yakutsk, named Chernichev, obtained his freedom during my sojourn in Irkutsk. He was on his way to Kaukasus, where he had been permitted to re-enter the army as a private soldier, and was recommended to the protection of M. Muraviev, who thus became, as provost, the entertainer of a relative of his own, and of his former general. The exile seemed to receive the revocation of his sentence with less satisfaction than I could have supposed. He had left a friend behind him, and, as I was afterwards informed, died before he reached Kaukasus, of a disease under which he had suffered at Irkutsk.

There was no want of balls and other entertainments among the better ranks during the butter-week, especially at the house of M. Dobrinskyi, who had voluntarily settled in Siberia, to enjoy a very considerable income which he possessed there. Among other things which surprised us at these festivities, was to find a company of Italian rope and ballet dancers, who were waiting for the summer to give a series of public entertainments, under the direction of a Signor Devotto.

It is the etiquette of Irkutsk, that all the members of the Government attend mass on all church or state holidays, and afterwards be invited to the house of the governor-general. The introduction of General Lavinskyi procured us admission to these hospitalities. By this means we obtained some insight into the system upon which the government of the country is administered.

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The governor-general exercises supreme control over Eastern Siberia, that is, over the government of Yeniseisk, and all the territory to the eastward, which is distinguished into the six following subdivisions:— the Government of Irkutsk, the province of Yakutsk, the province of Okhotsk, the north and south provinces of Kamchatka, and the islands belonging to the American Company, along with the settlements in California. These subdivisions are under the immediate direction of the resident officers, to some of whom I shall have to refer hereafter. They are all in communication, however, with the central authority in Irkutsk, from whence they obtain the rations in money and kind which are distributed to Russian subjects as a regular subsistence, and to the aborigines either as a relief in time of scarcity, or in consideration of certain services rendered to the crown. Large consignments of bread-corn are made, for instance, every year to the commandants about Yakutsk; from whom again the magazines of Okhotsk and Kamchatka receive their supplies, partly out of this stock, and partly from native produce. The Lena affords the means of transport for the greater part of the distance, so that the pood of meal, which is bought for 55 kopeks in Irkutsk, costs no more than 125 in Yakutsk; but then comes the carriage, by means of beasts of burthen, over the Aldan mountains, which I shall presently have an opportunity of describing. The forwarding of each horse-load — a weight of $5\frac{3}{4}$ poods (about 230 lbs.), is charged to the crown, at the rate of 14 roobles the pood, which consequently raises the price at Kamchatka to more than twelve times its amount at Yakutsk, and to twice the ordinary price in Germany.* General Lavinskyi

* These expenses might be considerably lessened by judicious arrangements. Goods forwarded by private enterprise may be purchased in Okhotsk at five-sevenths of the (transport) price paid by Government. A pood of Irkutsk meal costs the American Company only nine roobles on the west coast of America!

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had never been in Kamchatka, and, therefore, had no means of estimating the value of that province, but by a comparison of the expenses of administration with the income. His opinion was, that it was at once desirable, and politically impossible, that that peninsula should be given up for ever. According to my opportunities of observing the natural capabilities and advantages of that delightful quarter of the empire, my opinion is diametrically opposed to that of the higher Government functionaries. Very different views would, I am convinced, be entertained in Irkutsk, were the mercantile advantages likely to accrue from Kamchatka fairly brought under consideration. But this must be based upon a full conviction of the value of the Transaldanian provinces, the Aleutian islands, and the Californian colonies, as well as that the ultimate object of Governments is the welfare of the entire body of their subjects.

One of the most important departments of administration at Irkutsk is that of the Marine. It appears absurd almost to speak of a nautical establishment in the centre of the largest continent in the world, till we have had the opportunity of knowing that the lake of Baikal is justly entitled to the importance of a sea. There is a saying at Irkutsk that it is only upon the Baikal, in the autumn, that a man learns to pray from his heart. Lieutenant Lutkovskyi, who is now in command of the inland fleet, was superintending the construction of a brig and galliot, which was carried on during the summer at a little village on the borders of the sea. A good part of the necessaries for the outfit is manufactured in Irkutsk, where there are ship-yards too, but the vessels, when launched, have to be towed up against the rapid current of the Angarà to their destination.

The difficulties and dangers of the navigation of the Baikal arise from the violence and unsteadiness of

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the winds, as well as from the character of the bed and shores of the sea. The most dangerous of the winds is the N.W., which sweeps over the high and rugged mountains down upon the most frequented track, between the Selenga and Angarà. In the technical language of the native sailors, this is called the *gornui* or *mountain* wind, in contradistinction to the S.W., which, as it takes the surface in its whole length, is termed the *glubnik* or *deep* sea-breeze. The gornui sets in when the clouds begin to settle on the hills to the northward, cooling the surrounding air by the vapours with which they are loaded. The thickening of the horizon in that quarter, is therefore regarded by the mariners as premonitory of a gale. Squalls, however, are frequent from every point of the compass, and though this basin is 360 nautical miles in length, the direction of the wind shifts so suddenly, that it is dangerous for vessels to attempt to carry topsails. The waves are often seven feet high in a storm, but here, as well as at sea, we sometimes observe a violent rolling of the water, even when there is no wind. These are secondary waves, which are distinctly in advance of the wind; that is, they precede the current of air, and are more rapid in their progress. The winds here, too, are always found to blow first upon those points whence they appear to come; and this I have remarked is the manner in which they generally extend themselves over the seas in the colder zones.

The vessels belonging to the Government are built with keels, and manned with sailors from Europe. They are employed for the transport of the metals raised in the mines of Nerchinsk, and in conveying the yearly tribute of peltry from the Transbaikalian provinces, or officers of the Government, or convicts who are sentenced to banishment in Nerchinsk. Their voyages are begun in the middle of May, and

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they are laid up for the winter in the Angarà about the end of October. The most active period of the Chinese trade is the close of the autumn and the winter; but as no sledges can cross the ice before the latter part of December, the merchants of Irkutsk are in the habit of trusting their goods to this dangerous element during the month of November. The private vessels are flat-bottomed, 90 feet long and 30 wide, with knees 14 feet high, and drawing about 5 feet, with a burthen of from 90 to 100 tons. They carry only a single sail, and, with a fair wind, will sometimes run seven knots an hour. Such a rate, however, is very unusual. The breadth of the Baikal is from 50 to 70 miles at most, so that as the coast is always in sight, the course can be kept by the appearance of the land; and still it sometimes happens that the unsteadiness of the winds will keep the cleverest seamen seventeen days on a voyage, without their being able to reach the Selenga or find any other anchorage. On the northern side, the coast is for the most part bold and rocky, and, wherever the water is shallow, the ice accumulates at that season in such quantities that it is not safe to keep close in shore.

In November the entire border of the lake is frozen again, and then the transit is made in light sledges from the mouth of the Selenga to the outfall of the Angarà, without striking off from the land. This communication does not exist at all in summer, and even, at the close of autumn, it is too narrow to be used for the transit of merchandise.

Lastly, in December, when the navigation is interrupted by the ice, which is not yet, however, quite safe for travelling, the merchants adopt a third course. Their packages of tea come then direct from Kiakhta to Irkutsk by the Krugomorskaya doroga, or route round the sea, which is different still from the first mentioned along the shore. This crosses the moun-

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tains which form the S.W. boundary of the lake, taking the very highest point of the range, after traversing a desolate tract of 140 versts in extent, between Sniezhninsk, Sliudinsk, and Kultuk, the last of which is immediately on the westernmost end of the Baikal. Between Sniezhninsk and Sliudinsk this extraordinary mountain road is carried over the Long Ridge, as it is called, which is visible from Lake Baikal at a distance of 120 versts, and which must consequently rise 3825 feet, at least, above it, and 5170 above the ocean.*

Next come in succession, on the way to Sliudinsk, the Less Khamar, the Great Khamar (Khamar dabàn), and the Podkhamarnoi Khrebet, or the Rise of Khamar. The Khamar dabàn overtops not only the Long Ridge, but all the other peaks on the south of the Baikal. The top of this steep and barren mountain is only to be reached by zig-zags, protected on the side of the precipice with wooden palisades. It is said that this required 1000 trees, which had to be carried up by the Buraets on their shoulders, as the pass was totally impracticable for horses or oxen. It is now a hundred years since it was first constructed, and I was informed, notwithstanding, by the engineers of Irkutsk, by whom it was examined this year, that it was hardly possible to succeed better with the materials which were at hand. There remain still 47 versts from Sliudinsk to the shore of the Baikal, and this part of the road also has to be carried in zig-zags up the steep face of the hills, and secured with railings, though the ground here is swampy, and not bare rock, as on the Khamar dabàn. Lastly, we have 96 versts of good road from Kultuk

* I make the Selenga at Ustkiakhta 1600, and Irkutsk 1234, feet above the level of the sea. If then we take the fall of the Angarà (by the eye) at double that of the Selenga, we deduce 1345 feet for the elevation of Lake Baikal.

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to Irkutsk. In the summer months, the post is forwarded over this pass on horseback, but in December, when the tea-carriers use it, the snow lies so deep upon it that it is better to use sledges. The first attempts to cross the mountains from Sniezhninsk to Kultuk are attended with serious difficulties almost every season. It would seem as if all the snow that ought to fall at Irkutsk and upon the Transbaikalian districts were directed upon the mountain heights to the S.W. of the lake. It first begins to fall in August, and by December it will lie seven feet deep at this point. The plan then adopted by the yamshchiks is to tread down a narrow path by riding backwards and forwards over it. They then further clear out this passage with a narrow sledge, to which they tie branches of fir on either side, the horses being yoked gusem, or in a single line. Now, at last, they drive over the laden sledges, which, under these circumstances, will not make more than ten versts a day, with ten or fifteen poods (400 or 600 lbs.) of tea. The fourth, and safest line too, for traffic, is over the ice of the Baikal during the winter.

My first essay to test the subterranean heat of Irkutsk was with the boring instrument which I had brought with me from the Ural. But I found that a bed of sand in the public gardens which I had selected as favourable for my purpose, was underlain by a stratum of loose flint stones which it was impossible to penetrate; I was therefore obliged to content myself with a spring on the north of the town about eight versts off. I set out for this spot on the morning of the 10th of February, when the temperature of the air had fallen to $-23°$ R. Our way lay at first over a level road, and then up a considerable ascent overgrown with a thick wood of the common fir. The farm-stead, or as it is termed in Siberia, the saimka of Sitnikov, consisted of some pasture and garden land

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occupying the low ground at the foot of this ascent. It was in the middle of the court-yard, formed by a quadrangular range of wooden buildings, that the water gushed out from a bed of pebbles into a natural basin. It was covered in by a wooden shed, so that there was no ice to be seen at the source. The thermometer, when plunged into the middle of the little foaming reservoir, rose from —23° to + 3°·00 R., just the height it attained at Krasnoyarsk, nothwithstanding the more northerly situation of this place.

We should reason falsely were we conclude, however, that the temperature of the springs was identical with that of the dry ground, or even the mean of the open air. I was favoured by M. Chukin with a series of observations, made on the atmospheric temperature from 1820 to 1829; and making allowance for the influence of the different periods of the day on these results, I deduced the yearly mean height of the thermometer for Irkutsk and found it varying from —0°·2 to —0°·4, or a little below the freezing point. Of the accuracy of this conclusion no doubt can exist; but is the more elevated temperature of the spring-water so easily explained? The atmospheric vapours from which it is derived are precipitated here in quantities that preponderate so enormously in favour of the warmer months, that but for the refrigeration which the surface-water undergoes from the earth, it would average + 9°·06 R. for the whole year. In England, on the contrary, where the quantities of rain falling at different seasons are nearly the same, we should expect that, apart from the action of the earth, the common temperature of well-water would be nearly that of the air, so that Roebuck's observations are, of course, materially at variance with the experiments made at Irkutsk. For instance, I was enabled to ascertain that here $\frac{91}{100}$ of the vapours fall in rain having a mean temperature of + 9°·96 R. during

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the six months which are without frost, that is from April to September; while not more than $\frac{9}{100}$ will be condensed into snow, which cannot of course penetrate to the strata from which the wells are supplied till the thaws set in. The experiments and arguments from which this result is deduced, are of such a nature that no future direct observations will ever be able to disprove the existence of this inequality in the fall of rain in winter and summer, though they may possibly show that it has been taken too low. It may, for example, be discovered, that there are warmer springs than that of Sitnikov near Irkutsk, which would only show that the rain water from which they were derived had lost less of its heat in permeating the ground than where we made our observation.

As the earth must still be below the freezing point if we go to a depth of twenty feet, it must follow that water would congeal in it unless prevented either by its own excess of heat, or by accumulating into very considerable and rapidly moving veins. However that be, the vegetation of the district is varied and luxuriant. We heard much of the richness and diversity of the flowers which adorn all the gentler acclivities from spring to autumn. The environs of Nerchinsk are even celebrated for their floral treasures; it lies certainly somewhat more to the south than Irkutsk, but still so much higher, that there cannot be much difference of temperature between the two places. Spiræas, lilies, and rhododendrons flourish there, along with many varieties of the rhubarb and rumex, some of which have found their way to Europe. Among the plants and shrubs more generally known in Siberia, there is here a species of briar bearing a fruit very like our gooseberry. It is larger than the kruizhovnik or ordinary gooseberry of the Russians, and is called the mossberry, from its being found only in shady and mossy valleys. This very winter I was

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treated with two sorts of fruit that I had never seen before, and which had been preserved in the highest perfection in ice-houses. One of these was the berry of the swallow-thorn (*Hippophaë*), which contains a kernel of the size and form of a barley-corn, in a softish husk of the same shape, and of the colour of yellow wax. This is eaten frozen, and has an agreeable, sourish flavour. Its common Russian name is Oblyepícha, or clasper, from a number of berries always clasping the same fruit stalk. The Hippophaë rhamnoides is also a native of Germany, growing on the downs near the Baltic, but never extending there so far southward as the latitude of Irkutsk. This is not the case with some other of these indigenous fruits to which I have alluded. The congeners of the Chinese apple, as it is here called (the fruit of the Pyrus baccata), are only to be found native in the south of Europe, for it is pretty generally agreed among botanists that the wild apple of mid Germany is only a new comer escaped from our gardens. Those I tasted in Irkutsk came from Kiakhta. They form a long bunch and are round, about the size of a cherry, of a red colour and very sweet taste. They grow plentifully at Nerchinsk, but not larger than peas.

M. Turchanínov had discovered not less than 1000 phanerogamous plants in the neighbourhood, many of them unknown species. In spite of the climate, the flora of Irkutsk is richer than that of Berlin, exhibiting the plants of warmer countries intermixed with those of the arctic regions. The wild peach of Nerchinsk is a true apricot (*Prunus Armeniaca*), and contains a very agreeable kernel in a fleshless envelope; while, in the very vicinity of these products of a more favoured climate, we find the Siberian stone-pine and the dwarf-birch of the polar circle in the high lands. The same holds good with regard to the fauna of the Transbaikalian districts. We see

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the Tunguze, mounted on his rein-deer, passing the Buraet with his camel, and discover the tigers of China in the forests where the bear is taking its winter sleep. The appellation of Dauri or borderers, which the natives of the government of Irkutsk receive from the Chinese, is not inappropriately bestowed; for it would hardly be possible to point out any other country upon the earth combining such remote extremes of physical character and condition.

Much practical benefit was likely to arise from the exertions of the resident botanists to determine the true rhubarb (*Rheum palmatum*), among the many varieties of that plant which exist in Dauria and on this side of the Chinese border. Some specimens of the root had been found at Nerchinsk, which possessed the requisite properties certainly, but not in the same degree as the Chinese, one pood of which is worth 200 roobles in Kiakhta. The thanks of the medical world are likewise due to M. Turchanínov for having traced the Ballota lanata, which Gmelin had already distinguished as a peculiar species, and for having shown that it is to be found not only at Krasnoyarsk and on the Upper Yenisei, but also near Irkutsk.

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CHAP. IX.

LISTVENISHNAYA. — THE GALLOP ACROSS LAKE BAIKAL. — JOURNEY UP THE SELENGA. — TARAKANOVA. — OXEN YOKED IN SLEDGES. — TROITSKOI MONASTUIR. — VERKHNEI UDINSK. — SPRINGS NEAR THE UDA. — THEIR TEMPERATURE. — DRYNESS OF THE ATMOSPHERE. — ARSENCHEVA. — ENCAMPMENT OF BURAETS. — MONAKHONOVA. — UST-KIAKHTA. — TROITSKO SAVSK. — CHINESE FIRE-ARMS. — VISIT TO THE CHINESE FRONTIER. — APPEARANCE OF MAIMACHEN. — EARLY RUSSIAN MISSIONS TO CHINA. — BAIKOV'S JOURNEY. — HIS FAILURE. — WAR ON THE AMOOR. — BOUNDARIES FIXED BY TREATY. — THE DECENNIAL MISSION TO PEKIN.

February 12th. — It was about three in the afternoon when we left Irkutsk, under the same bright sun and deep blue sky that this region is always favoured with in winter. No mists occur but at the time when the river is freezing, as the water carries down a higher temperature with it from the Baikal, so that it is longer in cooling than the surrounding atmosphere. As far as Rasvòdina our way lay over the ice of the Angarà, which evidently was as rapid here as within the town. The ice in many places was nothing but an aggregation of rugged sheets and fragments, that had frozen together in such a manner as to make our drive as uncomfortable as possible, while in several spots long channels of unfrozen water lay along the banks.

A line of sandstone rocks, shelving slightly towards N.W., advance, in some places quite upon the river-bed, in others leaving sufficient space for the stream to divide into shallow collateral arms. It is in these that the most profitable fisheries lie; and in many places we could see the tops of the poles which support the weirs, projecting above the ice. The baskets,

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which are suspended from these poles, are of the same shape as those used in the Obi, but not of the same enormous size as those in which sturgeon is taken.

Upon approaching the station of Listvenishnaya, the rocks by the road-side suddenly become much more abrupt and steep, and are separated by deep wooded chasms. At this point we fancied that we saw a portion of the river free from ice before us, but it was the entire body of the stream which flowed, roaring along, at a temperature of —25° R. We now took the right margin at the foot of a perpendicular wall of rock. Thick mists rose like smoke over the water, and seemed to float onward with the torrent, while beyond it we had the boundless surface of the frozen lake glimmering in the distance. Listvenishnaya takes its name from the splendid woods of larch which extend over both sides of the spacious valley. We continued our journey by moonlight, and came to a rugged projection of the hills on our left, which formed a landmark between the Angarà and the lake, and then struck into a narrow tract, hemmed in between its waters and the rocks which confine them. The jagged and shattered outline of these gigantic masses was sufficient proof that the sandstone must have already given place to another formation. An open space now extended for some versts along the shores of the Baikal, and after some time we came upon a wide extent of ice, which we availed ourselves of, keeping close to the shore till we arrived at the post-house of Kadilnaya. At this point we turned off from the western coast directly across the sea, till we made Posolskoi, on the opposite side. There was no snow upon the ice, so that its surface shone like a polished mirror in the moonlight. The horses that were put under our sledges in Kadilnaya, had to be held on each side till the very moment of starting, when they broke at once into full gallop, which they

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kept up till we landed on the further shore. We completed seven German miles in two hours and a quarter; this is, undoubtedly, the most extraordinary, as well as the most speedy stage, upon any route in Russia. The smoothness of the way, however, was hardly more in our favour than the speed of the Buraet horses, which are supplied at the coast station. The regular and steady tread of our horses' feet rang over the wide and dreary waste, interrupted now and then by the creaking of the sledges, as they yielded to the draught; or by the duller noise emitted from the ice cracking under the increasing severity of the frost.

February 13th. — Nearly upon the spot where we reached the coast stands an antiquated looking stone edifice, surmounted with towers. This is the Posolskoi Monastuir; that is, the Monastery of the Envoy, which was built in commemoration of a nobleman of Tobolsk named Sabolotskoi, who was murdered by the Buraets in 1650, on his mission to the natives of the Upper Selenga. The view of the Baikal from Posolskoi, in the gleaming morning light, was enchanting. All along the shore the rays of the sun were broken and refracted in a thousand tints, from a confused range of shattered fragments and polished sheets of ice, that shot perpendicularly up from the adjacent plain. Beyond lay the glassy expanse, stretching away on the S.W. and N., to disappear in the dark blue sky; while, in the west, the glittering peaks upon the opposite shore seemed to rise out of the very lake itself, their lower parts being hidden by the convexity of the earth.

From Posolskoi we had to traverse a low plain overgrown with reeds and sedge, on which the sand and snow combined had spoiled the sledge track. This district has obtained the appropriate name of The Steppe; the post-station in the middle of it,

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— Stepnaya stantsia, lies near the mouth of the left branch of the Selenga, which divides into several arms before it reaches the sea. The two most remote channels are thirty versts apart in the ordinary state of the water; but some are constantly filling up with sand, others deepen. The Omul (*Salmo omul*, Pall.), inconceivable shoals of which ascend the Selenga in the early part of August, are consequently obliged to change their line of migration with the shifting of the river bed, much to the embarrassment of the natives of Irkutsk and Udinsk, who take large quantities of this fish in nets along the shallows.

We continued our course upwards along the Selenga, whence we had a view of a range of hills in the S. W., with their tops partially covered with snow. These were the highest points of the Khamar mountains, which accompany the southern bight of the lake, and sink down into wooded acclivities upon the Selenga. A level and fruitful agricultural tract lies on either side of this river, and the villages on the road are inhabited by Russian peasants. The post-house of Tarakanova, forty-seven versts from Stepnaya, is very ancient, and blackened by the weather. The windows, as in all Transbaikalian cottages belonging to Russians, are pieces of mica sewed together with twine made of black horse-hair, and before the door stands, as usual, the verst-post with its antiquated inscription, giving the distance by the post-road from St. Petersburg at 5963, and from Moscow at 5450 versts; so that the Russians of Tarakanova are only eighty versts further from the centre of the earth than from their own capital. Trains of sledges, laden with tea, were a frequent sight between Tobolsk and Irkutsk; but became every moment more extensive and frequent as we neared the grand emporium. Fifty or a hundred one-horse sledges would meet us in a body, with their packages of tea sewed

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up in hides. The drivers required with such a convoy are not many, and they lighten their work by having a bundle of hay on the hinder part of every sledge, so that each horse is sure to keep up with his leader. They generally go at a brisk trot, and bound out of the way like a flock of sheep when they meet a heavy carriage. The merchants hire the sledges and horses from station to station by tender; but, as we were assured, will sometimes take post-horses to save time. A hundred poods of tea will be conveyed in this manner, nearly at full speed, from Kiakhta to Moscow; and, still, posting is so cheap in Siberia that the merchants find their account in it. At this point, too, postage has reached its maximum; yet a packet of the weight of one pound Russian, can be sent to St. Petersburg from this, as well as from the sea of Okhotsk or Kamchatka, for one rooble.

The horses here are very active and spirited, of middle size, and remarkable for their open nostrils, and the liveliness of their eyes. Light brown, with black mane, is the prevailing colour. Their lively action seems a sufficient justification of the passion prevailing among the Buraets for horse-racing, which is nearly as much in vogue with the Russians at Nerchinsk. Their black cattle are also very distinguishable from the Siberian. The oxen which we saw, under the sledges or about the cottages, were small and strikingly characterised by the width of the angle between the nasal bone and lower jaw. The short and compressed appearance of the head, was still further exaggerated by the mass of curled hair which overhangs the forehead: their horns are short, and often converge horizontally before the eyes.

Leaving Tarakanova, we came to the monastery of Troitskoi, which, like all such establishments in Russia, is enclosed within a quadrangular wall, with towers and loop-holes at the corners. It con-

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tains only six monks and a prior at the present time. This religious institution was one of the earliest erections of the Russians on the further side of Lake Baikal, for it was here that Abbot Feodosyi settled in 1681, when he came with a few monks from Moscow to convert the Buraets, and afterwards superintended the foundation of the Posolskoi Monastuir, which was the second.

Troitskoi (Trinity) lies on the verge of a sandy plain, encircled by the wooded uplands that merge into the Udinsk chain. Near Polovina, forty-five versts further, we crossed the narrow ravine through which the Selenga forces its way into the plain, whence we had nothing but precipitous and naked rocks till we arrived at Verkhnei Udinsk: here we rested the remainder of the night and the following day.

The outset of the journey produced a most extraordinary effect upon my dog. The first day he did nothing but howl, and, though usually so good tempered, would snarl and show his teeth if I tried to hold him in the sledge; so that I was obliged to let him run after us. This he did for sixty versts at full speed, though he stopped every now and then to roll himself in the snow. At last he became so savage and uncontrollable, that I determined to leave him in the care of one of the villagers till my return. I make no doubt that it was the return of the spring which naturally induced this state of excitement.

February 14.—In Verkhnei Udinsk we remarked that several of the houses of even respectable exterior were hung with the remains of marine productions, either to dry or for ornament. They came, of course, from Lake Baikal, for the principal fisheries are carried on here for account of the merchants. The skins of the gray seal (*Phoca serica*) are disposed of to great profit in China; and pelicans, which are

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called by the Russians Baba ptitsa, or women-fowl, are caught by the fishermen in the Selenga, where they are very destructive to the salmon (omul). The snow here lay even thinner upon the ground than it did at Irkutsk. The road was sand, completely exposed, with the inhabitants driving along it in their smart sledges, just as they do in summer. The vehicles used by the peasantry of this vicinity have never more than two wheels, a mode of building which the Russians have copied from the Buraets. The wheels are high, with short spokes and very broad fellies, made of the roots of the larch, but without tires. The only track for sledges is on the ice of the river. This is not owing to the wind, as at Krasnoyarsk, but to the dryness of the atmosphere. The commandant of Verkhnei Udinsk promised to use his interest with the Khamba Lama to obtain permission for us to be present at the celebration of the religious service in a Buddhist temple, on our return from Kiakhta. We were, fortunately, able to make some return for the kind offices so politely rendered us by this gentleman, by satisfying his curiosity about the news from Berlin, where he had formed many acquaintances during a visit in 1812.

After determining the magnetic intensity and dip in the town, I drove to a valley about four versts above the mouth of the Uda, to examine the temperature of a spring. The Popovskyi Kliuch, or priests' fountain, gushes from the granitic rock on the right bank of the Uda, about ten feet above its surface. The water was now making its way under a hollow ridge of ice which had formed over it in the beginning of the winter, and extended quite down to the river. The thermometer gave $+1°{\cdot}50$ R. for the warmth of the spring, while the air was $-13°{\cdot}0$. The inhabitants of the town estimate its supply of water in summer, at 40 vedrà every quarter of an

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hour, or 1560 cubic feet daily, thus favouring, in some measure, our assumption of a limited atmospheric precipitation. At St. Petersburg, for instance, the quantity of rain falling on an area of 436 feet square, would be sufficient to maintain an equal discharge of water, even supposing it equally copious at all seasons; but here the area from which the water is collected evidently exceeds that which would be required for St. Petersburg.

Direct observation satisfied me of the unusually dry state of the atmosphere at Verkhnei Udinsk. At between three and four o'clock in the afternoon, and with a temperature of $-12°$, I found De Saussure's hygrometer to stand at $63°{\cdot}1$, that is, the air should fall to $-21°$ before there would be any deposition of moisture. All the water dissolved in a column of air, resting upon any spot in this district, would, if condensed into rain, form a stratum of not more than 3·7 lines in depth, or hardly $\frac{1}{40}$ of what it should amount to in more humid climates during summer.

A drive of 84 versts on the ice of the Selenga brought us to Arsencheva. The rocky banks of the river were more than commonly rugged, being rent and torn so as to resemble volcanic fragments, though, to our surprise, we found that they were composed of fine-grained granite.

February 15. —This morning the temperature had fallen to $-27°$ R., but the action of the sun's rays was, notwithstanding, very powerful when it reached its full degree of splendour, in the clear blue sky. The air was still more free from humidity than on the preceding day, for the hygrometer was only at $63°{\cdot}7$, though the cold was so much more intense. Some rime must have been deposited during the night, when the sky was so serene; and that being presumed, the entire vapour remaining suspended in the

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atmosphere, would not condense into a stratum of water of more than 0·85 lines in depth. It would require a reduction of the temperature to – 35° to convert this into snow. The Selenga at Arsencheva is bordered by a fringe of low trees of various sorts, which must have an agreeable effect in summer. Selenginsk was our next station: it is built on both sides of the river, at the edge of a steppe of great extent, and seemed a place of less importance than V. Udinsk, though it is the head-quarters of half a company of the Siberian border-artillery.

Just at the outskirts of the town we fell in with the encampment of a Buraet family, where we had our first opportunity of gathering some particulars of the mode of life and habits of this remarkable race. Their dwelling consisted of two conical tents upon a level plot of ground, and enclosed with a wooden paling, to prevent the horses from straying. The rest of their cattle were, as usual, left to pasture upon the neighbouring steppe: there the cows, sheep, horses, and camels, which compose the possessions of the Buraets of Selenginsk, find a certain, though scanty, subsistence through the winter. Their tents, like those of the Samoyedes, were constructed with poles meeting together at top, and encompassing a circular space below. Their felt tent-clothes, which supplied the place of the Obdorsk deer-skins, were, like them, doubled, but the Buraets arrange their tent-poles at a much greater angle above than the Samoyedes. Their occupants, who came out courteously to meet us, exhibited the usual projection of the cheek-bones, with the oblique and elongated eye, jet black hair, and teeth of unequalled whiteness. Their faces, as well as most of their furniture, were obviously discoloured by the smoke, which may, on the other hand, produce an effect in favour of their teeth, not only by really

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improving their colour, but by the influence of contrast with their skin.

The men had their hair, which they let grow upon the crown of the head, plaited into a long queue that hung quite down their backs. The rest of the head was cut close, but not shaved, as among the Tatars. The complete removal of the hair is distinctive of the priesthood. The head-dress of the women was extravagantly rich. They wore their hair in two thick braids, which fell from the temples below the shoulders; besides which they bind a fillet round their foreheads studded with beads of mother of pearl or Uralian malachite, and enriched with roundish pieces of polished coral. The unmarried girls interweave their braids with strings of the same costly materials. The beauty of the females is well deserving of such ornaments. Their eyes are lively and impressive, and their cheeks, notwithstanding the darkness of their skin, are tinged with a ruddy hue. A dress, fitting closely to the person, displays the symmetry of their delicate figures, and most of those whom we encountered seemed to be above the middle size.

The inside of their houses displays a whimsical association of civilization and rudeness. The fireplace is nothing more than a hole dug in the middle of the apartment, with the felt-mats and cushions on which they sleep ranged round it. We had already seen some specimens of their metal ornaments in Irkutsk. Their implements for striking fire are deservedly preferred to the European, and bear a high price among the Russians. They are made of plates of the best tempered steel, from four to six inches long, stitched to a purse for holding the tinder, the purse being of red leather and tastefully ornamented with silver and steel spangles. We often remarked the steel work of their riding gear and other articles of furniture, so beautifully engraved, and so firmly

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and cleverly inlaid with plates of copper and silver, as to rival the execution of the artists of Tula. I may here mention, among other samples of their workmanship, a pipe, which had been executed in the steppe, and which could hardly be turned out more elegantly finished from any workshop in Europe. It was only about a foot long, which is the usual size here, and had an exceedingly small bowl; which, as well as the stem itself, was wholly of silver. Both of those portions were adorned with reliefs, and inlaid with red coral, while the stem was in two parts, closing so neatly with a sort of hinge, that the junction along the bore was sufficiently air tight. The only Chinese articles we saw with them were tea-cups and bowls of varnished wood, which are capable of resisting the action of boiling water.

An object which from religious associations seemed more deserving our attention, was a sort of altar which stood against the wall of the tent opposite the door. It was a kind of double chest, carefully finished, the lower portion of which was about four feet long, by about three high, and the same in breadth, while the upper, with the same length and height, was considerably less wide. The hinder sides of both were precisely in a line, so that the greater breadth of the lower chest left it to project beyond the other, and form a sort of table in front. Several drawers were contained in the lower chest, in which all the requisites for the performance of religious worship were deposited during journeys. A highly coloured painting hung down upon the front of the upper compartment and concealed it entirely. It was a representation of Chigemune, the principal burkhan or saint of the Mongols, sitting as if engaged in prayer with his legs drawn under him. Upon the table before this figure, six round bronze cups of about an inch in diameter were ranged at equal dis-

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tances; they were filled with water, and a mirror, also round, and of the same metal, lay among them. This apparatus is used by the lamas or priests for a purpose which is compared by the Russians to the consecration of water according to the Greek rite, but it is more probably a symbol of the transmission of spiritual endowments. The figure of the burkhan is held opposite to the mirror, a stream of water being at the same time poured over it into the little dishes, which in this manner receive the image of the divinity along with the water. The discovery of similar mirrors in the Kurgans or strangers graves, in the circle of Minusinsk, has been already noticed.

We now continued our way across the plain on the right of the Selenga. There are some granitic rocks to be seen in the neighbourhood, so smooth and upright, and standing upon a base so small, that they might be almost mistaken for artificial columns. At fifteen versts from Selenginsk, at Monakhonova, a chestnut-brown porphyry takes the place of the granite. Its crystals of feldspath are set in green earth; there are narrow chinks in it, too, filled with feldspath, which runs in veins through the mass. After this we have micaceous slate and porous wacke till we come to Ust-Kiakhta. They form a sort of rugged wall on the western bank of the Selenga, the eastern being almost a dead level.

The snow lay thinner as we advanced, so that we had to keep the ice of the river. Kaluinishnoi is a station upon a hill near the left bank, inhabited exclusively by Buraets; so that the post-house is in the hands of one of their members, whom poverty has reduced to settle as a cultivator of the soil. At two o'clock we entered Ust-Kiakhta, at the junction of the Selenga and Kiakhta. Some well wooded heights to the southward, in conjunction with the flowing stream, render this spot a sort of oasis in the sterile district; so that it is an agreeable summer re-

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sidence for the merchants of Kiakhta, among whom the family of Igumnov is distinguished by the possession of a stone house. The vehicles drawn up at the post, and before the other houses, were almost innumerable, and all upon wheels, as it is here that the road to Kiakhta leaves the ice of the Selenga. But merchandise from Kiakhta is, contrariwise, to be forwarded by sledges. In exchange for ours we obtained two tilegas, the bodies of which rested immediately upon the wooden axles; against which they made a fearful clattering as we ran the next eighteen versts at full gallop to Troitsko Savsk. Our road, which was bordered by thick pine-woods and without a trace of snow, led us southwards over a rocky soil with steep ascents and much shorter descents. The barometer showed a difference of level of 606 feet between Ust-Kiakhta and the Chinese frontier, which we reached about four in the afternoon.

Troitsko Savsk is a fortress in nothing but the name; it was never designed, nor is it maintained, as a military post, being merely composed of some rows of wooden houses at the confluence of the Kiakhta and one of its tributaries. The Russian custom-house, with the residences of the clerks and Buraet Kosaks employed about it, comprehend a large portion of the town, so that the preponderating importance of Kiakhta and Maimachen, which lie four versts to the westward, is evident at the first glance.

February 16. — Our hospitable entertainer at Troitsko Savsk, was Captain Ivan Philippovich Ostrovskyi, of the Transbaikalian Kosaks. This service is recruited from the natives in the frontier provinces of the government of Irkutsk. Four regiments of 600 men are supplied by the Buraets, and a fifth, of 500 men, by the Tunguzes of Nerchinsk, which relieve each other alternately. Their duties are performed less with the bows and sabres with

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which they are armed, than by their acquaintance with the Mongolian language, in acting as interpreters between their countrymen and the Chinese. Captain Ostrovskyi had learned the Buraet dialect in his youth almost as his mother-tongue, and had found himself sufficiently intelligible, even to the Chinese-Mongols, when he visited Pekin in the suite of the Russian envoy. He observed the same mildness of character in the Chinese of the capital, which distinguishes that nation on the borders of their empire; but with all this, the most scrupulous anxiety that the mission should not exceed their powers, nor bring one hair more than the specified number of attendants with them. The Russian escort consisted of no more than fifty Kosaks, without any artillery, only armed with firelocks, which they justly considered sufficient to overawe the Chinese troops in case of need; as the favourite and almost exclusive arms of the latter are only crossbows and darts. Some matchlocks were seen among them; but their powder is very far inferior to the Russian. As to the pieces manufactured in Siberia, which were offered them by the traders to the Chinese, these seemed neither to have inclination to use, nor money to purchase them.

Many of the houses have galleries on the roof, where the inhabitants pass the cool of the evening: it was from one of them, that we got the first view of the road which winds along a rising ground bordering the Kiakhta, in the direction of Maimachen. The sledge-way over the ice of the little river, and the higher road upon its left bank, unite at the wooden palisade which forms the barrier of Kiakhta. The entrance of this well-known frontier town is just like that of a German village. A Kosak keeps guard, with his drawn sword, to prevent any articles of merchandise passing in or out unless by a written permit from the custom-house. We were now within the

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precincts, or, at least, in the Russian half of the market-place, and found the houses of the merchants of the better class with stairs and balconies in front, and, in some cases, painted and embellished with architectural ornaments. Three camels met us just as we passed the gate, which were much longer haired than the Chinese camels that we saw afterwards. They belonged to the Buraets of Selenginsk, who were now thronging the streets, on their way to a religious festival at Maimachen. Chinese traders, too, met us at every step. They wore long gowns of black silk, fitting close to the body; their hats were of black felt, nearly in the shape of a crown, the part for the head forming a hemisphere, and having the brim turned up all round; a tassel of red silk falls down on each side from the top where there is a copper stud in the centre, on which a ball of some coloured stone, or other material, is fixed: this being the mode in which the several ranks are distinguished in China. The merchants here had rarely any such badge, and dare not, as I was informed, wear anything but a golden bulla, as they are accounted to belong only to the lowest class, both in China and Russia. They all had cases for their ears, to protect them from the cold. These cases were angular and oblong, made of paste-board, and covered with black silk, their open side fitting to the temples. Their thick silken skull-caps fell below the edge of their hats, and their heads were shaved, except upon the very crown, from which long queues hung down their backs. A long purse is attached to their girdles, just above the right hip, and in it they carry their tobacco and pipe, with its wooden stem curved at the lower end, and its diminutive bowl of brass. They were all hurrying over the boundary line, for every Chinese is obliged to be in Maimachen before sunset. We followed the crowd that was pressing forward towards a nar-

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row door in the front of a long wooden building. This admitted us into the inner quadrangle of a Russian warehouse, where merchandise is stored and disposed of by wholesale; but not exposed to view. A corresponding door, at the opposite side of this court, opens just upon a wooden barricade, which constitutes the barrier of China. In this there is a wide portal, ornamented with pillars, and displaying the Russian eagle above it, along with the cypher of the reigning Emperor, Nicholas the First, by whom it was erected.

The change upon passing through this gate seemed like a dream, or the effect of magic; a contrast so startling could hardly be experienced at any other spot upon the earth. The unvaried sober hues of the Russian side were succeeded all at once by an exhibition of gaudy finery, more fantastic and extravagant than was ever seen at any Christmas wake or parish village festival in Germany. The road-way of the streets consists of a bed of well-beaten clay, which is always neatly swept; while the walls of the same material, on either side, are relieved by windows of Chinese paper. These walls do not at first sight present the appearance of fronts of houses, as the roofs are flat and not seen from the street. Indeed, they are nearly altogether concealed by the gay-coloured paper lanterns and flags with inscriptions on them, which are hung out on both sides of the way. Cords, with similar scrolls and lanterns, are likewise stretched from roof to roof across the street. These dazzling decorations stand out in glaring contrast with the dull yellow of the ground and walls. In the open crossings of the streets, which intersect each other at right angles, stood enormous chafing-dishes of cast-iron, like basins, upon a slender pedestal of four feet in height. The benches by which they were surrounded were occupied by tea-drinkers,

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who sat smoking from the little pipes which they carry at their girdles, while their kettles were boiling at the common fire. It is only the porters and camel-drivers, and the petty dealers, that is, Mongols of the lowest class, who thus seek refreshment and chit-chat in the streets. Some of the poorer of the Russian Buraets occasionally resort there too; and both nations avail themselves of the niches or little chapels which are seen at the corners of the adjacent houses. These are dedicated to Buddha, and when the doors were open we could readily distinguish the images of the saints within. Metal dishes, like those observed by us in the tents at Selenginsk, were placed before these divinities, and filled with consecrated water; and between them were pastilles of vegetable extracts, and in the shape of slender yellow rods, which emitted no flame, but a bluish aromatic vapour; we saw reddish tapers, also, of tallow, which were occasionally lighted by some passer-by. Similar tapers were burning against the door-frames or walls of the chapels, either in the open air or in lanterns of various taste.

The Mongols of the lower orders wear close jackets and hose of gray camel-hair cloth, without the upper garment of the traders. They are little used to be treated with consideration by their superiors, so that they returned our salutations with great cordiality, always offering us their pipes. A peculiar and distinct dialect of the Russian language may be said to have here grown out of the intercourse with the Chinese. The merchants of Pekin, some of whom have regularly visited Maimachen for twenty years, have of necessity acquired some knowledge of Russian, but have permitted themselves so many novelties in pronunciation and construction, that it has been found convenient for both parties to adopt their strange patois. Hence, a Chinese is never called a Kitaets

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here, as in other parts of Russia, but a Nikanets (pl. Nikantsi), a term which in Mongol is said to mean a valiant warrior; whereas Kitaets is derived from a contemptuous appellation bestowed by the Manchoos on their Chinese subjects. A pretty thing, for instance, is called in the Kiakhta dialect chogolskaya or dandyish; while a paper rooble is known by the familiar title of moneta. The Russians themselves are changed into O-lo-lossi, by the substitution of one or more *l's* for every *r*, and the separation of every two consecutive consonants by some nasal sound or mute vowel. We ourselves were asked if we were Tsiani, the name given to Europeans, and seemed to satisfy themselves that we must be Khundi, as the English are called among them, from a word that is explained to mean red-heads. The money-value of things, however, seemed to interest them most, for some of our smoking acquaintances set themselves very coolly to inquire the price of some parts of our clothes, as if they had an intention of making us an immediate offer for them.

We proceeded on our walk, and came to a wooden tower at the intersection of two of the principal streets. This was a square building, with four doors and a flat projecting roof. The level platform which rested upon the four walls was protected by a balustrade, and from its centre rose an octangular turret, terminated by a similar pyramid with concave sides. From the corners and apex of this roof, lines of lanterns and streamers, of every variety of colour, ran down to the railing of the platform; while each of the perpendicular faces of the turret was covered with grotesque paintings representing allegorical figures, which brought forcibly to our mind Cortes' description of the Mexican temples. The subjects were human figures, with the faces of brutes, painted red and green, some of them having the claws of devils

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and other phantastic appendages. A few priests were standing on the roof of this tower, which is, strictly speaking, an observatory, and not a religious edifice. Altogether there was nothing in this at all resembling the Mongol chapels just mentioned, much less the stately temples of Maimachen, in which the Manchoos and Chinese nobility perform their religious rites.

Sunset was now announced from the tower by gongs, and by the faint report of gun-shots from some of the houses, so that we had no alternative but to leave the town. It is only during especial festivals that any exception is permitted to this regulation. The merchants and Mongols, of whom we made inquiries in the streets, could give us no further information than was contained in the word *pashol* — go; pointing, with their characteristic gentleness, to the northern gate, which led us out of China.

February 17. — The relations subsisting now, and in former times, between Siberia and China, were the subject of our conversation to-day, while we enjoyed the company of M. Golekhovski, the director of the Customs, and other officers and merchants residing in Kiakhta. Troitsko Savsk with all its importance, dates no further back than 1727. During the preceding century, the commerce of the Siberians with the most powerful of their southern neighbours, though carried on at several points, had never rested on the security of a treaty. A singular record of the early attempts to obtain a treaty, is to be found in the fragments of a journal kept by Fedor Isakovich Baikov, the son of a Boyar of Tobolsk, who conducted, in 1655-8, one of those earliest embassies to Khambalu, that is to say, to Pekin. On his way thither, he gathered about him a caravan of Russian and Bokharian merchants, with whom he resided for six months in the capital of China. Yet, at the conclusion of that time,

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"neither himself nor his people could tell whether Khambalu was great or small," because they were kept confined in the house assigned for their residence, as if in a prison. His behaviour to the Chinese potentate was any thing but pliant. He complained that there were only ten courtiers sent, and only half a verst, to welcome him into the city. He was not to be induced to alight from his horse at the gate of the city, and bend his knee before the palace of the Emperor, for he maintained that he never saluted, even his own Tsar, but when he met him, and then, too, he stood, and only took off his hat. He found cause of offence, also, in the tea which was offered to him in the name of the Emperor, when he was making his entry into Pekin; for though it was only the first week of the great fast (3d March, old style), yet the tea was made, sinfully, and, as if to insult him, with milk and butter. Baikov condescended, after much persuasion, to take a cup, but he returned it unemptied; and he remarks thereupon, that the Chinese courtiers affected to take no notice of his evasion. They seem, however, to have thenceforward taken a less good-humoured view of the Kosak's bluntness. Some days afterwards they came to the Russians, by order of the Bogdu Khan, to receive the presents of the Tsar, and to give a formal receipt for them. But here, again, the sturdy Kosak raised fresh difficulties, for he insisted that, according to the customs of Russia, the envoy should first present his master's letter, and afterwards deliver the presents as marks of attachment. Some months passed away, during which Baikov was pressed in vain to deliver his letters to the minister of the Bogdu Khan, and to practise the necessary ceremonials and signs of homage preparatory to his receiving audience. But he continued obstinate in his determination to deliver the Tsar's letters to the Emperor with his own hand, and

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also to salute his Manchoo Majesty only in the Russian fashion; until, at last, on the 12th August in the same year, his presents were sent back, and he himself was ordered to depart; "as he had in no respect met the Emperor's wishes. His demand to have at once an audience of the Bogdu Khan, was presumptuous, for such a mark of favour was reserved exclusively for the most eminent of the Emperor's own subjects and servants; and the refusal to go through the usual ceremonial was so much the more offensive, as a Russian envoy of much higher rank, named Peter Yaruishkin, had, as well as all other European ambassadors, already performed it in Pekin."

This mild reproof is a remarkable example of Chinese patience; Baikov, however, thought otherwise, and with great naïveté complains bitterly that they allowed him to quit the city without showing him any further courtesy, and with only the necessary guides. It is remarkable that he soon after repented of his proceedings, for when he had gone but a nine days' journey from Pekin, he halted and sent an Indian, who was serving in his train in the capacity of a kashever, that is, cook or baker, back to the capital, to ask pardon of the Bogdu Khan, and to promise that he would perform all required of him. The negotiations, in fact, were renewed, but only to be broken off decidedly, in consequence of another irregularity on the part of Baikov. The Chinese couriers, who were sent from Pekin, found him no longer at the place where his cook had left him; he had gone, for some reason unexplained, three days further from Pekin. When information of this move reached the capital, couriers were immediately despatched to the Russian camp, to tell Baikov, as he himself relates, that "conduct such as his gave proof of little understanding; and, although he styled himself the Tsar's

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envoy, he wanted the capacity required for that honourable office."

Baikov speaks, in his simple journal, of a Dutch embassy which was in Pekin at the same time as himself, with which, however, neither he nor any of his followers could hold any communication for want of some acquaintance with the Latin language. He further relates, and quite correctly, that the Manchoo dynasty began thirteen years before the date of his journal, that is, about the year 1642. To the last ruler of the Chinese race he gives the name of Daba, though, in the histories of China, written by Europeans, that prince is named Dzun-jen. Baikov says, that at the Mongolian invasion this prince went out of his mind, but that his son endeavoured to defend his rights. He made his escape, with a party of faithful adherents, to one of the frontier towns, from whence he long carried on a desultory warfare with the Mongol or Manchoo invaders.

The failure of the first attempt to establish an intercourse between Russia and China may be attributed, partly, to the misconduct of the individual employed for that purpose by the former power, and partly to the circumstance that the need of such a convention was not yet felt in China, the boundaries of the two empires being at that time in much less perfect contact than at present. It was not till some years later (in 1661) that the Kosak Pokhabov founded the first mixed settlement, on the site of the present Irkutsk; and in the course of the following ten or twenty years, the Russians from thence advanced so far into the possessions of the Buraets and Tunguzes, who were independent of China, as to become immediate neighbours of the Celestial Empire. In the time of Baikov, on the other hand, the only known road to Pekin went direct from Tobolsk along the Irtuish to its sources, and thence to Khukhu-khoton or

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the Green-town, through the domains of independent Kalmuks, and of agricultural colonists from Bokhara; and also over steppes, in which wandered the forefathers of the present Khalkhas Mongols, whose rulers, descendents of Chingis Khan, were also independent.

It was owing to the latter of the two grounds of failure here assigned, that a second embassy, despatched to Pekin in 1675 with letters and presents, proved equally fruitless; but, shortly after, the relations of the two empires assumed a new position, by the clashing together of their respective subjects on the Amoor, in the province called by the Chinese that of the Daurí or borderers. Some exiles had effected their escape from Yeniseisk, led by one Khabárov, who had been a Polish hetman. They had settled themselves far beyond the present Russian boundaries, on the Amoor, in long. 52°·9, and 20° east of Irkutsk, in the midst of Tunguzian tribes; where they built and fortified with palisades the little town of Albásin. There they lived for many years in complete independence, till they offered, just as Yermak had done a century before, their conquests to the court of Moscow, by way of atonement for some murders and other misdeeds. The place was recommended by its remarkable fertility, and, consequently, a voivode, or commandant, was sent thither by the Tsar, together with a garrison of 100 men. But in the meantime the independent freebooters had worn out the patience of their Daurian neighbours, and obliged them to demand succour of the Manchoo court. The consequence was, that a Chinese army, 4000 or 5000 strong, with fifteen European cannons, made its appearance, in 1684, before Albásin, burnt all the buildings, but allowed the Russian garrison to withdraw uninjured to Nerchinsk. The harvest was ripening at the time, and had such charms in the eyes of the conquered, that they waited

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for the retreat of the Chinese, and then, contrary to their engagement, again established themselves at Albásin. In the ensuing spring, they rebuilt the town anew, strengthened it with circumvallations, and brought together in it 1500 men, well armed, promuishleniks and Kosaks.

The Chinese were soon made acquainted with these proceedings, and, being no less obstinate than the Siberians, they returned, in July of the same year, with 3000 cavalry, 5000 foot soldiers, and 40 pieces of cannon, to the scene of contention. The besieged, after holding out for some months, were at last compelled by hunger to surrender, and a number of them were carried off as hostages to Pekin. This violent rupture, however, between the two empires, made them more intimately acquainted with each other, and conduced to the establishment of their present system of mutual relations. The European Jesuits, who, in the expeditions against Albásin, had lent a hand to guide the proceedings, now also induced the court of Pekin to conclude its first formal treaty with Russia; and, in 1689, it was agreed at Nerchinsk between the Russian envoy, Fedór Alexéyevich Golovnin, on the one side, and the Chinese officers and the Jesuits on the other, that the valley of the Amoor should remain entirely and always with China, but that free ingress and egress across the frontier should be allowed to the caravans of both nations. The good understanding thus established, however, was again disturbed in the beginning of the eighteenth century, chiefly through the intrigues of the Europeans residing in Pekin. Nevertheless, an ambassador from Peter the Great, Captain Ismáilov, was well received at the Chinese court in 1719, but to his demands for a more intimate commerce between the two nations, he received only conditional and procrastinating replies. It was required by the Chinese, among other

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things, that the subjects of China, of the Turgut tribe of Kalmuks, who, in 1636, had fled beyond the boundaries of the Celestial Empire, and had settled on the Volga, should be compelled to return to their original homes.

It was not till 1727, under Catherine I., that a new and definitive treaty was ratified between the two Governments. One Count Ragusinski, who is better known in Russia under the name of Sava Vladislávich, went to Pekin, and received from the Emperor a letter to his van, or lieutenant, in the city of Urga (120 miles S.E. of Kiakhta), empowering this officer to arrange on the frontier the terms of the treaty. It was then settled that the Russians should evacuate the valley of the Amoor, that the Turguts should be allowed to remain in the settlements which they had chosen, and that a free commerce between the subjects of the two empires should be carried on at the common boundary on the river of Kiakhta; but the privilege of the Chinese was curtailed by this condition, "that no stone houses should be built on the frontier, and that the Chinese merchants should not bring their wives to reside with them at the mart on the borders." In the same year, Troitsko Savsk was founded, and in some measure fortified also, by Sava Vladislávich, from whom it took its name. Russian merchants and adventurers soon settled there; in the course of a few years Maimachen, too, was built, and the trade was carried on every year from October till January, just as we see it at the present day, fluctuating in profit and activity, according to the circumstances of the two countries. With respect to tolls and duties, and other similar matters liable to dispute, they are either arranged between the Russian customs' director and the sarguchei or chief officer in Maimachen; or, when they are of a more general and important nature, between the

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governor-general of Irkutsk and the van or Manchoo lord-lieutenant in Urga. The rank and functions of the sarguchei are compared in Kiakhta with those of a Russian officer of the seventh class; but in the exercise of his local authority, he is not careful to confine himself within the narrowest limits. He sits to administer justice, orders very severe punishments, and reports only in criminal cases to the van in Urga; who, on the other hand, cannot inflict the punishment of death until he receives confirmation of the sentence from Pekin.

An immediate and very important consequence of this treaty was the permission to send from Russia to Pekin what is called a spiritual mission, and to change it regularly every ten years. In order to explain officially this important stipulation, the Russian Government could allege nothing further than a desire that the posterity of the prisoners taken in Albásin should have the means of continuing in the Christian faith, with the instruction of priests of the Greek church. At present the posterity in question are hardly to be found, and still the Chinese Government keeps its engagement faithfully, to the great benefit of European ethnographers and politicians, who owe to these missions the most authentic and extensive information relative to the Celestial Empire and its administration.

The influence of the trade on the Chinese frontier extends from Kiakhta to the centre of Germany. M. Kotelnikov, a merchant who possesses an establishment in Kiakhta, gave us an account to-day of the purchases of linen which he himself had made in Prussia. He named Breslau, Liegnitz, Züllichau, and Berlin, as places with which he had dealings, and to which he had frequently travelled from Kiakhta. For himself and his agents, journeys of 1500 versts in the year were nothing extraordinary.

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CHAP. X.

FESTIVAL OF THE WHITE MOON. — THE PROCESSION. — A COMPANY OF PLAYERS. — THE HOUSE OF THE SARGUCHEI. — THE DINNER HALL. — THE FEAST. — MULTITUDE OF DAINTIES. — PROMENADE. — THE TEMPLE OF FO. — OFFERINGS. — IDOLS. — VISITS TO THE CHINESE MERCHANTS. — INTERIOR OF THE HOUSES. — SUMMARY JUSTICE. — BRICK TEA. — STOCK IN THE WAREHOUSES. — SUN-DIALS. — COMPASS. — DOLLS. — FINE ARTS. — FIREWORKS. — AMOUNT OF TRADE. — THE PLAYHOUSE.

February 18. — THE festivities of the new year, or the White Moon, as the Chinese call it, began this year on the 18th of February, with an entertainment given by the sarguchei to all the more respectable inhabitants of the Russian and Chinese towns. Through the friendly offices of M. Golekhovski, we also received an invitation to Maimachen.

The Russian officers spared no pains to give as much solemnity as possible to this annual manifestation of friendship. All the sarguchei's guests on this side of the border, assembled in the house of the comptroller of Customs, in Troitsko Savsk, and went thence in state carriages to Kiakhta,—Kosaks, Russians, and Buraets; and the interpreters rode on horseback on both sides of the carriages. In Kiakhta visits were paid, after the Chinese fashion, to the principal Russian merchants, beginning with the agents of the Russian-American Company.

Our carriages and horses stopped at the gate of Maimachen, and we proceeded thence, in regular procession, to the house of the sarguchei. The houses were decorated with coloured and inscribed papers, more gaily and gaudily than on the 16th. M. Golekhovski told us that these inscriptions were written

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in Manchoo, or the language of the court. He had acquired some knowledge of it by his intercourse with the people during a residence of several years on the borders; and he explained to us the meaning of the characters on many of the flags which hung before the merchants' houses. They contained the names of the families, together with some words of auspicious import, — as gladness, riches, wisdom, &c. In the court-yards of the houses was to be heard the noise of little crackers and rockets, which the merchants were firing to celebrate the day; but more particulary also, out of courtesy, and by way of doing honour to the guests who were entering the place. The smell of the Chinese powder was oddly mingled with the peculiar odour of the candles burning in the Mongolian temples.

The streets presented a very animated appearance, and in one of them, near the sarguchei's residence, was a crowd of people, in masquerade costumes, making as great a din as possible, with all the instruments of noise. This was the company of players of Maimachen. They had wooden drums, shaped like casks, brass cymbals, and plates of the same metal, or gongs, held by a string and beaten with knockers, and wooden truncheons, of different sizes, which they used as castanets. Deep, indeed, was the impression which the simultaneous thundering of this musical battery made on the ears of the passer-by. Several of the performers personated women, and so very naturally that one might have almost suspected some infraction, in this respect, of the treaty. The younger and more delicate faces had been selected for the female parts; and the deception was rendered more perfect by means of wigs and long tresses of black hair, but especially by curls pressed flat upon the forehead, which reminded one of the old French fashion of wearing crochets. We saw no masks, pro-

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perly so called; but, instead of them, the faces were painted white, black, and red, in oil colours; in some cases with a view to represent spectacles, moustaches, &c., and sometimes to conceal the human features, or make them look monstrous. One face was covered with coloured rays, which issued from the mouth. The same actor had also a feather on his head, which is, in Chinese comedy, the conventional mark of a ghost or apparition. Another wore a golden helmet, which was enough to constitute him a warrior. Several kept beating themselves incessantly on the hip with a cane, and by so doing intimated that they were on horseback. I received the explanation of these conventional modes of representation from Russians, who had seen such plays and pantomimes frequently and for many years, for they are produced at every Chinese festival.

This day's performance consisted of two acts, which to us, who knew nothing of the language, seemed to present very little change or variety. The whole company formed a ring, in which, during the first act, they marched one after another, in a very slow and measured step. At the same time all the musical instruments were beaten, and between every two blows a syllable, of a kind of recitative, was ejaculated by the whole company. The raising of the feet coincided with the beating of the instruments, and the fall of them with the syllabic chorus so exactly, that nothing can be conceived more regular and solemn. After the circuit of the stage had been made two or three times, a rattling, hurrying music, succeeded to the andante; and during the second act, which began here, most of the dancers tripped with great rapidity on tiptoe, like birds, one after the other round the ring, while some, in the middle, delighted the spectators at the same time with extraordinary leaps and clever drollery. They threw the two sticks, with

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which they had been previously making a clatter, into the air, and then, springing up, caught them as they fell, with the most extraordinary contortions of the body. It seemed as if the spectators were allowed to take an active share in these plays, for when, by way of experiment, I made some gestures of a tender kind to one of the pseudo-ladies, she showed herself ready to reply to my overtures with an embrace; and thenceforward, the horsemen, too, showed me particular attention, pointing with their sticks to my spectacles, as often as they passed by me, and trying to touch them, to the great delight of the Mongols around. They were evidently all amused at seeing a real counterpart to the painted spectacles of some of the actors.

A peculiar smell of leeks, which had appeared to me to issue from the breath and the clothes of the inhabitants of Maimachen, was also plainly perceptible in the actors; and one might well be justified in saying to them, with Shakspeare, "And, most dear actors, eat no onions." Yet these were no artisans or labouring men, turned players on a particular occasion, but the members of a standing company.

It was evident that our entertainer had sent forward these players to receive us, and to inspire us on the way with a mirthful and holiday humour; for, after repeating their dance several times, they placed themselves at the head of our train and conducted it, with an unceasing clatter of wooden instruments, to the house of the sarguchei. A broad roof, supported by three rows of columns, covered the portico of the house towards the street. Between the columns were hanging the bows and quivers of the police soldiers, who form the magistrate's body-guard. Here the players remained to perform music during the feast, in order to amuse the people and give them a full share of the holiday pleasures. The apartments into which we

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now entered, were on the ground-floor, like all the rest in Maimachen. At the door of the first of them, was standing a crowd of the sarguchei's Chinese guests to welcome us. Each of them did his best, with studious eagerness, to shake every one of us by the hand. There was something like childish simplicity in these most scrupulous salutations, and yet the performers of them were, for the most part, elderly looking men. They were all dressed to-day in black silk stuffs; but over the ordinary coat they wore a jacket also, with white sleeves, which reached down only to the girdle.

From the antechamber we entered the dining-room, at the further end of which was our host, who, rising from his cushioned seat, advanced a few steps towards us in a calm and dignified manner. The sarguchei was a tall thin man of a rather stern countenance, and of about fifty years of age. His coat, and the white jacket over it, were made of grey plush silk or velvet; and, like the other Chinese, he wore in the house the black felt hat, with the red tassel on the crown, and a button of white stone, which indicated his rank. The thumb of his right hand was adorned with a ring of Chalcedony an inch wide, which is among the Manchoos a mark of official dignity. His nails did not extend above half an inch beyond the tips of his fingers, his personal vanity being in this respect subdued, as might be expected in a man of sober mind and mature years.

In conformity with the treaty above mentioned, the walls of the sarguchei's palace are constructed wholly of clay. The dining-room forms a rectangle. Of its longer sides, one has a very wide window and two much smaller ones; the first extending from one corner to the middle of the apartment, and yet admitting but little light, owing to its being under the portico. The panes in it were formed, as in the

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houses in Siberian villages, of small pieces of mica joined together; but the windows of the merchants' houses in Maimachen are, in general, much handsomer. They are square frames, in the middle of which is a circular wooden ring, held in its place by four wooden bars or sashes, which lie in the diagonals of the square. The circular portion alone contains a neatly formed pane of mica; the other four compartments are filled with transparent paper, the frame-work being painted black, and, like all the house decoration and furniture of the Chinese, very carefully finished. It is evident that in this instance the merchants follow the original national plan, and that the sarguchei fancied that he was adopting European fashions, when, in fact, he was only copying the peasants of Sabaikal. This was the only particular observed here which could be imputed to the spirit of imitation. Everything else was novel and peculiar.

Parallel to the longer side of the room stood four square tables in a row, covered with scarlet cloth, and sufficiently distant one from the other to allow the attendants to pass round them. After some bowing and silent ceremonial, the company took possession of the seats round the tables. At the table farthest from the door, against the narrow side of the room, stood a cushioned divan for the sarguchei, and with it were three arm-chairs for favoured guests. I had the good fortune to occupy one of them, close to the host, and at the fountain head of the conversation. At the other tables were set forms, which the Russians and Chinese occupied in such a manner that the former sat with the face, the latter with the back, to the window. These seats, too, had a covering of scarlet cloth.

Behind the chair of M. Golekhovski stood the Russo-Buraetian interpreter, who had come with us; and

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close to the sarguchei were two young members of his official retinue, who translated what was said from the Mongolian into the Manchoo, the only language which he understood. These young linguists seemed much pre-occupied with the elegance of their dress. They were robed in red, and, among other things, wore on their hats long sable tails, which projected like plumes of feathers, but backwards, and in a horizontal direction. These are worn merely for ornament, and do not serve, like the peacock's feathers, which are similarly placed, or, like the buttons on the hats, to betoken rank. With the aid of the interpreter there now commenced a tolerably well maintained conversation; but which, owing to the infrequency of this sort of intercourse, was confined, for the most part, to reciprocal inquiries respecting health, and other such civilities. The discourse of the sarguchei was characterised by dignity and ease; his voice was soft, but sonorous. Among other things, the uniform of the Norwegian navy, worn by Lieut. Due, excited his curiosity. He asked briefly what was the meaning of that dress, which differed from the military uniform of the Russians; and this being explained, he again gave all his attention to the business of the table and the appetites of his guests.

In the middle of each table stood a round cabinet made of paper, which, being now uncovered, exhibited a great variety of dried fruits in different compartments. The piece of table furniture in question was shaped and arranged exactly like the cabarets now commonly used in Europe, and which were evidently introduced in the first instance from China. In the contents we recognised large apricots, stoneless raisins, and many other things which we had already met with in Kasan, Tobolsk, and other Siberian towns lying in the track of the trade with Bokhara; and,

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besides, there were large pears and grapes, which are brought here frozen. The Chinese fruits seemed to be still larger and sweeter than those of Bokhara. We tasted of every thing, to acquire, in conformity with Chinese notions, the reputation of well-bred men. Tea was handed round at the same time in porcelain cups. The Chinese drink it without any addition; for the Europeans there was sugar in the middle of the cabinet.

After a little time a number of servants carried off the sweets and the tea-cups, and laid before each of the guests a piece of fine paper for a napkin, and a pair of ivory chopsticks or keh-tse, as the Chinese call them, in place of forks. These are two cylindrical rods, of the length and thickness of a black lead pencil, which are both held between the fingers of the right hand, and are used as tongs to take the food and carry it to the mouth, an operation by no means easy for the unpractised. The tables, which were six feet wide, were then covered over thickly with small porcelain plates, about the size of our saucers, containing every one of them a different and, in general, a very complicated eatable. All these dishes are served up cut into very thin strips, so that they may be seized easily with the chopsticks. They are, consequently, for the most part unrecognisable, and only the more experienced of the Russians were able to point out to us different kinds of mushrooms, pieces of pheasant, of pork and mutton, of fish and other marine productions, which, in the pickled, preserved, or dried state, were sent hither from Pekin. There were also some specimens of those sea animals which give occasion to the tale that the Chinese of Maimachen esteem earth worms a great dainty. These pieces of gelatinous animals might, in the dressed state, be easily mistaken for worms; but from perfect specimens which M. Golekhovski procured for me next

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day from the kitchens of the Chinese, I convinced myself that the viands in question were made of the large and long muscles of the *Holothuria fuliginosa*. All these ingredients are dressed with a great quantity of fat, but at the corners of the table were cups containing weak and not very well flavoured vinegar, in which the guest dipped the meat to make it more digestible. The contents of the little plates were soon consumed. The servants then brought on a tray a second, and in succession many more courses of new kinds of viands, which were laid upon the preceding stratum, until at length there arose a lofty pyramid of gastronomical curiosities.

We had eaten of a hundred dishes at least by the time that this second act of the feast was over, when pipes, ready charged for smoking, were handed round to all the guests. The head, or receptacle of the tobacco, in the pipes of the Buraets and Chinese, is not much larger than a thimble, and one is obliged therefore to adopt with them the general Asiatic custom of swallowing the smoke, for the sake of the more stimulant effect and the prolonged enjoyment of every whiff. The only fault to be found with the Chinese pipes is, that the mouth-piece, like the rest, is of bronze, and has often an astringent and disagreeable metallic taste. At the same time were presented small glasses with Chow-sen, or Chinese rice spirit, and with the common Russian spirits distilled from grain. The first was so bad that the Chinese preferred the Russian spirit.

When the pipes were finished, the third course, consisting of different kinds of soups, was served; and then, to finish the feast, pipes were brought a second time, and on each table was set a fuming, steaming vessel, which we erroneously supposed to be a tea-urn. It was heated with charcoal, lodged, as is the case with the Russian samavar, in a tube, situate

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in the middle of the fluid, and it contained, not tea, but an infusion of cabbage-leaves, which was drawn off by a cock, and drunk out of cups.

When the feast was over, the sarguchei conducted us into the principal temple, dedicated to the worship of Fo, the religion of the Manchoos. It is close to his palace, the court-yard and offices of which we passed through in our way. Adjoining the dining-room, which we had just left, was a small study, in which we saw nothing but an arm-chair and a desk covered with papers. We then went through a long corridor, having on the left some windows into the court, and on the right, doors opening into the kitchens and store-rooms. In these rooms, a great many men seemed busily employed; which was not surprising, for so many dishes, so elaborate and various, could have been produced only by the work of many hands. The court-yard was shaped like a horse-shoe, two sides of it being formed by the dwelling-house and these kitchen buildings, while the third side contained a coach-house for the sarguchei's travelling carriage, and another room, which the flag waving over it gave us to understand was the court of justice. We examined narrowly the Chinese carriage, and found it to resemble almost exactly the German sheep-cart, only that its two wheels were higher and heavier than in the latter, and the side window was fitted with a plate of mica, like the covered narts used in travelling to the Polar Sea.

The temple, which we now visited, has two wings, separated by curtains from the central portion of the building, which has a separate entrance. In the court in front of it lie two colossal lion-shaped figures, made of clay and painted green. Here, too, flags and banners were waving before the doors. A few steps brought us to the threshold of the sanctuary, which, like every thing else in Maimachen, made on us a

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deep impression of matchless singularity. At the background of the quadrangular area, in the first wing, was a broad step or elevated space, on which were four or six idols of the size of life, and with the oddest expressions of their attributes. They were made of clay, and most fantastically painted. This part of the building is closed by a curtain, between which and the figures were lying or hanging the vessels and finery required for the performance of the ceremonies.

But the eye of the curious spectator turns involuntarily from the vague and the monstrous to the more intelligible offerings, which are brought here by the devout, on these sacred occasions, in amazing quantities. They lay heaped up in hillocks at the feet of the statues. Among them were whole sheep without the skin, plucked fowls, pheasants, and guinea fowls, in their natural positions and glistening with fat. There was a long table like the counter in European shops, running parallel with the threshold of the temple, so that it was necessary to go round the ends of it, in order to get from the door to the statues. On this was now built up an absolute wall of offerings. Six sheep occupied the middle, and round them lay dressed meats and cakes of every kind. The whole was surrounded with an extremely elaborate structure of white dough, which was reared from the ground to the height of five or six feet, so as to be above the table. The dough or paste was formed into an open lattice-work, like that with which we sometimes fence our gardens, but the openings in the lattice-work were here filled with dried fruits and confectionery of the finest kind.

Respecting the idols, which are grouped in a semicircle, it must be remarked, in the first instance, that the two near the middle were manifestly the principal, while those standing at the sides were of subordinate

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rank. As to explaining what they represent, I can do no more than repeat the words of the Russians who accompanied us, and who called one of the figures in the middle the god of riches, the other the god of horses. The other figures were said to represent the attendants of these. The god of riches, as he was called, might be supposed to personify rather the kindred ideas of superabundance and fertility. He was a grand-looking figure, with a long and well-arranged beard, and almost completely clothed, yet he was as indecent, and evidently on purpose, as the Priapus or Garden God of the Romans. This might have had the same allegorical meaning here as in Rome, but in this case there were added certain decorations, which again showed the singularity of Chinese taste, and of the customs to which it gives rise.* To the figure called by the Russians the god of horses, one of the subordinate figures presents with the right hand a horse, the relative smallness of which indicates that the gods are of gigantic size.

The other wing of the temple is similar in plan and arrangement. The central, and largest idol, represented, as we were told, the god of fire. It was a sitting figure, naked, with manifold deformity, and of a fiery red colour. In the middle of the body, in front, was inserted a piece of glass, which might perhaps be meant to indicate the translucent nature of fire. Another idol, in the same part of the building,

* The peculiar ornament of the figure in the temple of Maimachen agrees so perfectly with a description which occurs in Pigafetta's Journal of his Voyage (with Magalhaens) round the World, that it at once authenticates the traveller's statement, and receives explanation from it. The passage in question, which relates to a singular custom existing at that time in Java, is to be found at page 217 of Amoretti's French edition of Pigafetta (Premier Voyage autour du Monde, 8vo. 1801; the Italian edition is here more reserved). Thus it appears, that the religion of Fo in Maimaichen contains manifest allusion to an ancient custom of the inhabitants of Java, and presents evidence of a practice, the existence of which, not thus attested, would be naturally called in question.

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was styled by the Russians the god of the cow; and, in fact, there stood beside it a figure representing one of the god's attendants, and holding in the hand a cow. The central apartment, between the wings, was but dimly lighted by a few candles, and we saw in it some large brass discs with clappers, hanging from the ceiling, and which are struck when any one bearing offerings enters the wings. There was also standing there, on a spot raised like a throne, a large brazen vase, with perfumed candles burning before it, like those which we had seen in the Mongolian chapels. This vase contained the inscribed lots, which are drawn by the devout Manchoos when they would learn their future destiny.

From the temple the whole party went again into the streets of Maimachen. The sarguchei was now conducting us and all his guests to visit the principal Chinese merchants. The interpreters in red clothes, of whom I have made mention already, still kept their place among the chief functionaries; and, indeed, they were said to be young men of respectable condition, and were probably candidates for public office. Some police-soldiers of the sarguchei's body-guard now followed his steps. They carried sticks about six feet long, and somewhat bent, so as to resemble bows unstrung. After them came the Russian and Chinese guests. The head of the procession looked still more lively and varied. It was already dark by the time that we returned into the street, and lanterns were therefore borne before us, on long wooden poles, by four men. They were cubical frames, of about eighteen inches in each dimension, covered with variegated and transparent paper, richly ornamented with inscriptions and figures of a dark hue. Immediately after the lantern bearers followed the players, whose legs and throats might be well supposed to be tired by this time; yet they were just as loud and

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active now as they had been in the morning. They kept dancing, leaping, and capering before our party, and never ceased singing and making a noise with their cymbals and wooden drums.

We visited about a dozen of the merchants' houses, the body-guard, lantern-bearers, and the rest of the mob remaining before the doors. We were welcomed by servants at the threshhold, who lighted little rockets, about an inch long, and crackers, and threw them over our heads. Our host then received us in his chief apartment with such another feast as that of the sarguchei; but the meat gradually diminished in quantity, and the treat was at last confined to conserves, tea, and pipes. The merchants kept pressing their guests continually with the words pi khai, pi khai, which means drink, drink; for it is a source of satisfaction to them when their tea is drunk eagerly by their friends. The teas served on these occasions were what are denominated *family teas;* that is, the product of certain plantations in the province Phudjan, the farming of which is hereditary in certain families. The tea which arrives at Maimachen, under the name of one and the same family, may belong either to the black or green variety, or to any one of the almost countless subdivisions of these. The name of the planter serves merely to testify a known origin, and consequently to warrant the genuineness and purity of the article; whereas, what is called *common tea*, is much less esteemed, because it is brought by factors, who are unable to tell exactly whence it came. The merchants in Kiakhta, therefore, bestow the greatest attention on the study of the marks affixed by each family to their chests or packages of tea; and written lists of these, as well as of the names of all the subvarieties of tea coming from the same plantation, with translations into Rus-

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sian, are looked upon as indispensably requisite for the proper management of the tea trade.

The apartments of the merchants were more elegantly fitted up than those of the sarguchei. They generally serve as shops for the sale of the finer articles, which are kept in presses along one side of the room, and are arranged with the minutest carefulness. On the side of the room opposite to the presses, and through its whole length, is a wide projection, about three feet high, which serves at once as a stove and a sleeping place. It is built of brick and is hollow, with an opening at the side through which the fire within is supplied with fuel. The brickwork is covered with wood, and on this are placed cushions and silk coverlets ; the adjoining wall of the room is also tastefully hung with red silk. In the middle of every room there stands also a metal brazier for making tea, such as we had already seen in the streets of Maimachen.

In the course of our walks through the streets we witnessed an example of the despatchfulness of Chinese justice. The sarguchei was jostled or rudely pushed in the crowd by a drunken Mongol of the lower orders. He spoke a few words in an angry manner to one of the police soldiers, who immediately seized the offender, while the rest of the company quietly continued their march. I staid behind to learn the issue of the affair, and saw the policeman push the Mongol against the wall and throw round his neck a thin iron chain which he carried with him. The unfortunate delinquent, trembling with fear, muttered some words of apology; in reply to which he received only boxes on the ear. It was curious to observe the feeling exhibited by the crowd of bystanders on this occasion ; they sided with the stronger : for as soon as the prisoner held his tongue they all began to talk, admonishing him, no doubt,

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to behave better for the future; for every sentence ended with the speaker's putting his fist to the prisoner's nose, until at last the latter was dragged off to prison. In this place of confinement the prisoners stand in the open air, and in a kind of pillory, their hands being fixed in two openings in a board which passes horizontally over their heads. The hunger which they have to endure in this painful position is usually reckoned part of the punishment. The Russians told us on this occasion of a far more cruel punishment, inflicted by the predecessor of the present sarguchei on one of his inferior officers who had maligned him. He had the offender's mouth filled with a mixture of human excrement and water! But the sarguchei, it is said, is authorised only in inflicting those punishments which in China, as well as in Russia, are classed under the head of paternal punishments. We learned from our Manchoo guide, on taking leave, that his name consisted only of the single sound *oo*.

February 19. — I went early this morning to Kiakhta, and thence to Maimachen, to make some purchases there in the Chinese phusi or shops, in the view of becoming better acquainted with their contents and management. From M. Basin in Kiakhta I learned, that, instead of current coin, brick-tea alone is used here for money. This article, to which I have frequently had occasion to allude, is a mixture of the spoiled leaves and stalks of the tea-plant, with the leaves of some wild plants and bullock's blood, dried in the oven. In Irkutsk, where an imitation of it has been attempted, elm leaves, sloe leaves, and some others have been substituted with tolerable success for those of the wild plants of China.

In the southern provinces of China there are a number of manufactories in which this article is prepared. It is divided into pieces weighing from three

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to three and a half pounds each; and having always the same prismatical form, exactly like that of our bricks (in Russian, *kirpich*). Hence, they may be called in Germany brick-tea, with more propriety than tile-tea, as they are usually styled. The Manchoos themselves never make use of this production, but to the Mongolian nomades in China, to the Buraets and Kalmuks collectively, to the Russian peasants south of the Baikal, and to most of the Siberian Tatars, it is become as indispensable as bread in Europe. About 300,000 lbs., that is, 4000 bales or half horse-loads (in Russian, miésta), of it are brought annually to Kiakhta. This is sufficient for the supply of 10,000 people, if it be assumed that they drink brick-tea twice a day the whole year round, as they do now during the winter. Every brick or kirpich contains sixty or seventy portions, because the infusion made with it is mixed also with rye-meal, mutton fat, and with kujir or búsun, that is, salt from the lakes in the steppes. The rich people among the Russian Buraets and the Kalkhas Mongols lay by stores of this article, which serve them for money, although the weighed silver bars which are used in China reach the bazaar in Urga, also, in the course of trade. In dry situations the brick-tea will remain a long time undeteriorated; and, consequently, an accumulation of it in the steppe is often thought a better and safer treasure than great herds and flocks. In Maimachen and Kiakhta it is an article of no less importance. The Russians purchase an immense quantity of it from the Chinese; but, besides, the kirpich or brick of tea is the money unit and standard of value, in which the price of every other kind of exchangeable property is expressed.

The merchants of Kiakhta commence their dealings, therefore, by asking those of Maimachen how many bricks the commodities which they wish to purchase

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are valued at; or, in other words, at what price they are set down for the year. They then put upon the squirrel skins, which they bring to market in great quantities, a fixed price in tea bricks and their fractions; and their further traffic is carried on by written bills, always expressed in the same vegetable money. Russian officers, when they wish to make small purchases in the shops of the Chinese, buy of their fellow-countrymen in Kiakhta, for Russian money, the requisite capital in bricks. In this transaction, the exchange of the rooble into the tea-brick is managed by taking the value of each as compared with the squirrel's skin; the rooble being changed according to the market price of the skin in Irkutsk, the tea-brick according to that in Maimachen.

The tea brick, at this time, was worth about two roobles. It is often necessary to pay fractional parts of this unit, which the Russians and Buraets cut off, measuring by the eye; and the Chinese make no difficulty about taking in payment the pieces cut in this way. To meet my expenses, I preferred depositing 100 roobles with M. Basin in Kiakhta. One of his clerks, who accompanied me as guide and interpreter, told the Chinese merchants that I possessed bricks then, and subscribed the accounts, which they drew up in Chinese characters, and kept to be presented when the time of settlement came.

The merchant's houses, which I have already described, have always a wall of the same height at the side, through which there is an entrance, much wider than the house door, from the street into the court-yard. In some of the houses to-day we saw the gates open, and the camels going in, which were just arrived from Pekin laden with tea. They carried the bales on both sides of a pack-saddle; and they had, each of them, the cartilage of the nose bored through, and a semicircle of bone inserted in it, which was

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thicker towards its extremities, and projected about two inches out of each nostril. To the ends of this bone is fastened the bridle. In the town the camels went along without any apparent want of a driver, following one another very quietly. In the yards they were fastened to the wooden pillars of the sheds, which run along the dwelling-house and the store-houses towards the interior. The spaces between the pillars are filled by neat trellises of split bamboo; screens of the same kind are fastened also in the windows of the shops. Generally speaking, there prevails in these court-yards the same neatness and good order as in the interior of the houses. The camels were immediately unloaded, and then driven to the pastures outside of the town.

In the store-houses round the court-yards, the merchant of Maimachen keeps only his most bulky stock, which is also to him the most important; as, for example, tea and bales of kitaika, or that coarse woollen cloth, which is here called *bu* or *siba*, and is indispensable for the clothing of every Russian inhabitant of Siberia. I confined myself to the examination of the finer productions of industry, which were shown to us in the warm chambers of the phusi or merchant's dwelling-house, and many of which I had never seen in Europe. In every instance we found the master of the house smoking and drinking tea in his room; and he took care that we, too, during our dealing, should not be in want of a pipe and a full cup of tea.

It is manifest, that cups, in the form at present usual among us, were received from China in the first instance, for what we call the saucer is with us nearly useless, but with Chinese tea-drinkers, it plays a very necessary part. Here the genuine custom of the country is to put into the cup a few leaves of tea, on which boiling water is then poured. The cup thus

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filled, fits perfectly tight to the saucer, in the middle of which is a circular depression to receive it. The extract, when ready, is poured into the saucer, out of which it is always drunk.

At my first visit to-day to one of the Chinese merchants, I offended, unawares, against the religion of Fo, by eating from a dish of dried fruits, which was standing on a separate table in one corner of the room. My Russian attendant explained to me, when it was too late, that this was a sacred offering for one of the domestic gods. But the merchant displayed the tolerance of an enlightened man, for he smiled with placid dignity, and protected his god from further pillage only by ordering another supply of the same fruits for us.

It can hardly be doubted, that the shops of Maimachen present but a very incomplete sample of the industrial riches of Pekin; and yet we saw here proofs of science, of art, and of remarkably pains-taking habits among the Chinese. Among the scientific articles, I reckon the portable sun-dials, which were set in position by means of an attached compass. The adjustment of a thread, which, when the instrument is arranged for use, coincides with the celestial axis; and the marking of a horizontal and inclined hour-place on the body and cover of the box, are essentially the same as in the instruments of like kind, which the artists of Nürnberg used to make a few centuries ago; only that in the Chinese dials, day and night together are divided into twelve parts, of two hours each, instead of twenty-four hours as with us, and are distinguished by those twelve signs which the Chinese astronomers use for all divisions of the circle. The first of these Chinese divisions of the natural day, extends from 11 P. M. to 1 A. M.; and on the dial of Maimachen, the extreme shadow-lines coincided with the beginning of the fourth division and the end of the

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tenth, so that it was calculated for a day of fourteen hours in length, and not more.

The magnetic part of the apparatus differs in so many particulars from the European compass, that, even on this account alone, one would be inclined to ascribe to the Chinese an independent invention of that important instrument. The magnetic needle of the instrument which I purchased in Maimachen, is but five Parisian lines long, and the steel or magnetic portion of it weighs but a quarter of a grain; but it is united to a copper cap, weighing ten times as much, or two grains and a half, and which turns on the point that supports it. The magnetic needle lies about half a line higher than the point of support; the centre of gravity of the copper portion is as much below the same point. The under side of the copper cap forms a flat square; the sides are half as long as the needle. This singular arrangement, which European instrument makers never thought of, is not without considerable advantages, for every shake sets the system with which the needle is connected in lively oscillation, which is sufficient to overcome the friction at the point of support. The magnetic force, weak as it is, turns the needle more easily, when it is thus set in motion by gravitation, than when the centre of gravity coincides with the point of support, as in our European compasses, and the needle is at rest. In this latter case, the whole of the friction must be overcome by magnetism.

In this, as in all the other Chinese compasses which I have seen, the southern half of the needle is marked with a red line; and the character which marks the south on the surrounding ring is distinguished from the rest, as being the most important, by the same colour. It has been long known that the Chinese philosophers attribute magnetic attraction, as well as many other physical advantages, to the south-

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ern regions of the earth. By the angle of the gnomon on the instrument in question, I found that it was capable of giving the time correctly, under the thirty-second parallel of latitude nearly. It is likely, therefore, that it was made in Nanking, in lat. 32°·1, and not in Pekin, which is in 39°·9. At the former place, the longest day is 14h. 6m., which agrees with the extent given to the hour circle on the Maimachen sundial. At Pekin, on the other hand, the longest day is nearly 15 hours.

I saw no other kind of instrument for measuring time in the ware-rooms of Maimachen, and yet in every one of them there were—as toys for children or for childish adults, who seem to form a numerous body in China—numbers of puppets, or figures of men and various animals, which moved progressively and in various ways, by means of springs and wheel-work, and showed that the art of clock-work is completely developed among the Chinese.

Paintings on different kinds of paper are brought in great quantities to Maimachen. They are partly in the miniature style, executed in the small form, with great neatness and elaborate minuteness; and partly for the decoration of chamber-walls, being about two-and-a-half feet wide, and six or eight feet long. Even these deserve commendation for their warmth of colouring, and for the neat handling of the pencil, which is hardly to be matched in any other country among artists who execute pictures by the dozen for the retail trade. The national writing of the Chinese prepares them, in some measure, for this kind of skill, for it requires great ease in the movements of the hand. Here, in Maimachen, I saw them sometimes writing with reeds, which were split like our quills, but had much broader and softer points than we give our pens, and sometimes with very fine pencils made of squirrels' hair. They use Indian ink rubbed in

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water, and unsized paper.* To me, after a few attempts to make use of these materials, they appeared as inconvenient as the keh-tse, or chop-sticks; but the practised merchants write characters and our numerals with them, as handsomely as our caligraphers.

With respect to the paintings here mentioned, it must be remarked that the subject of them, as well as the price, seems to depend on the material on which they are executed. Wall-paintings, on thin, unsized paper, are extremely cheap, and are obviously intended only for the lower classes. They represent Chinese landscapes and dwellings, with groups of figures half the size of life, and the various employments of men, or else harmless caricatures and religious allegories. The productions of the Chinese pencil would, therefore, be as instructive as they are charming, if it were not that the far more costly paintings, on sized paper, have a quite opposite character. These differ from those above-mentioned by a more brilliant colouring; they are laid, also, on striped silk, and in order that they may be hung or rolled up, they are fixed to wooden rollers, at the ends of which are handsome knobs of ivory, glass, or polished stones. Their favourite subjects are licentious adventures, the men and women figured in them being easily recognisable, by their dress and bearing, as the representatives of the better class of Chinese townspeople. These indecent themes, however, are, like all the rest, drawn and finished with the greatest care. It would seem, too, as if these subjects had led the Chinese artists to add some ideality to nature, for in representing naked figures they give the female

* In the Russian trade this black pigment is very properly called Chinese ink (kitaiskoe Chernilo). The merchants carry their writing materials usually at the left side of the girdle in a long case, just as was customary in Germany in the middle ages. The ink is rubbed, as often as it is wanted, in a little bowl, which occupies the place of the ink bottle in the case.

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skin a very beautiful and tender fairness, while they give the male skin that dark brown hue which we see here, in the faces of all the Chinese and Mongols, without exception. It can hardly be supposed that there is so great a difference between individuals of the same nation, in which both sexes go clothed; and one must rather recognise in this respect the same kind of idealisation in Chinese art, which is seen in the paintings of Reubens: but the European artist exaggerated the colour of the male, while the Chinese have evidently added fresh lustre to the female skin, and, for the male, have remained true to nature, according to the Mongolian type.

The same indecency prevailed in the paintings on all the porcelain tea cups in Maimachen, without exception; but here, also, licentious reminiscence seemed intended wholly for the wealthy, for the obscenest paintings always bore the highest price. Paintings in far better taste, and in colours equally beautiful, were to be seen on certain window blinds, which are brought here for sale under the name of Shtori. They are made of thin and perfectly uniform haums of a kind of grass, about eighteen inches long, two of which always lie in the same line, so as to form the breadth of the blind. These haums are arranged parallel to one another, half-a-line apart, and are held together by three thin strings, which run lengthwise through the blind. They are then coloured and varnished on one side, and on the other painted with figures. This mode of forming screens against the light, is frequently met with among the Asiatic nations; and I shall have to describe it as a means ordinarily adopted by the Yakuts, to protect their eyes.

The works of sculpture found in Maimachen, are reliefs and entire figures of wood, of bronze, and of masses of stone, partly shaped by nature, partly by

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art. They form the ornaments of frames, screens, lanterns, &c. Many of them also belong to the stock of useless articles or toys in which these magazines are so rich. All these productions bear witness to the care and patience of the Chinese workman; and sometimes they exhibit also very correct drawing. It is probable that the Chinese were prompted to attempt sculpture, in the first instance, by the favourable material which is found in their country. This is the statuary stone or combination of silex, aluminous earth, kali, and water, which occurs in talcose transition rocks, and is so soft that it may be cut with a knife, while, at the same time, it is susceptible of polish. I saw figures of animals, about an inch long, foliage, and idols, cut out of this material, all which were for sale at an extremely low price. The stone was of itself white or bright yellow, and translucid at the corners; but, when wrought, it is generally tinted of a reddish colour, and in a manner so perfectly illusive, that it is only by breaking the stone that one becomes convinced of the presence of colouring matter. No less numerous, but much dearer, were the articles cut out of the hardest stones. These were large spherical bowls, and oval vases of chalcedony and agate, and reliefs cut in carnelians, nephrit, and other coloured stones. Of the latter kind, the most common are flowers, the several parts of which are formed of various and tastefully selected stones, and then cemented with mastic on a foundation of stone. For many of these articles, which were highly elaborate, and, at the same time, quite useless, the merchants of Maimachen asked 4000 tea-bricks, or about 2500 Prussian dollars. In this we saw a proof of luxury and profuse expenditure among the Chinese; while many other branches of industry indicated enervation and effeminacy of manners.

The merchants offered me for sale musk and little

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bags of perfume, strung like beads; and they insisted that these things were indispensable for a young man. They showed also, in their own clothing, how they were used; for even the elderly men in China carry these perfumes in their girdles, along with their smoking apparatus. Equally essential, in their opinion, is a singular plaything, consisting of two polished balls, about an inch in diameter, which the men always carry with them. These are taken in the right hand, at idle times, and rolled and rubbed one over the other with the fingers; the noise which they make amuses, and, perhaps, there is something agreeable also in the feel of them. Here, in Maimachen, I saw some of these balls made of glass, striped green and white, and hollow, containing within them a little lump of clay, which rattled with every motion. The glass had been so thoroughly fused, and was so well finished, that even when the ball was broken, one could hardly tell where it had been joined.

I purchased, also, for the purpose of more careful examination, a number of articles which I saw used by the Chinese in ordinary life. The little crackers, rockets, and other fireworks, are brought here packed in neat cases. Here, as well as in the Chinese markets, they form a very considerable article of trade; and I subsequently met with them in Brazil, also, whither they are brought from Canton, and where they serve at the celebration of religious holidays, just as in China at the feast of the White Moon. I saw them, also, sold in Germany in large quantities, as childrens' playthings; and in this case it is well worthy of remark, that, after so distant a carriage, the productions of Chinese industry were still able to compete with those of Europe. Still more extensive is the trade in drinking vessels of turned wood, and in wooden vessels of the larger kind. They are lacquered and covered with a varnish which makes them

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quite capable of holding boiling water. I bought one of the brown-lacquered wooden tea-cups, such as are used generally by the Buraets, and convinced myself, by using it during the rest of my journey, that it never affects, in the least degree, the taste of the warm drink with which it is filled. On the back of these cups is marked, in black Chinese writing, the word *thai*, or large, which indicates the distinction between these and the porcelain tea-cups. The latter are no larger in China than in Europe, whereas the wooden cups for the Buraets contain rather more than the fourth of a Prussian quart. Of the cylindrical scented candles, intended for religious uses, I also obtained some specimens without any difficulty, although the seller remarked, with laughter, that he thought things of that sort were of little use to me.

It is remarkable, that in the commercial intercourse which takes place here, the industry of the Asiatic people, in almost every instance, shines conspicuously above that of the European. I saw here, for example, among the goods which the Chinese had obtained in Kiakhta, the same metal studs or buttons which are sold at the fair of Obdorsk to the Ostyaks and Samoyedes, to ornament their girdles. It is possible that the supply for the whole of Northern Asia issued from the same manufactory; for here, as in Obdorsk, they were stamped with the figure of a dog, and differed from those seen with the Ostyaks only in being better polished for their more civilised purchasers. These, as well as iron pots, copper kettles, and other Russian hardware, are procured by the Chinese of Maimachen, not for their own use, but for the wandering Mongolian tribes within the limits of the Celestial Empire.

The articles which we saw in the interior of the Phusi, or magazines of Maimachen, give, however, but a very imperfect idea of the trade of the place.

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This may be better estimated from the fact, that of tea, properly so called, and of the kinds used in Europe, not less than 70,000 mièsta, or half-loads for pack-horses, are purchased here annually. Each of them weighs at least two poods (80lbs.); and the whole quantity purchased may be reckoned, therefore, at about 5,000,000 of Prussian pounds, worth from 10 to 15,000,000 of Prussian dollars. The trade in rhubarb, too, is considerable; if, as I was assured in Irkutsk, the Chinese deliver annually 10,000 poods of it, or to the value of about 600,000 dollars! From the Russians, on the other hand, the Chinese buy every year, on an average, besides the wares already mentioned, about half a million of rooble's worth of Polish linen, and woollen cloth to the same amount, or, altogether, goods to the value of 300,000 dollars.

Close to one of the temples of Maimachen, which we had to pass by, stood a theatre, where the company, of whom we have already given an account, were now acting. The structure was merely a wooden stage, supported by four posts, about ten feet from the ground, with three covered sides, and a light roof. On this occasion the play was a connected story, of which, however, I saw but the last scene. The subject of the play was the liberation of a condemned malefactor, by the interposition of a superhuman being, who, like some other characters in the piece, was represented by men in women's clothes. All the actors appeared to be full of life and sensibility. It reminded me of Italian comedy; and the comparison was the more just, as several of the theatrical dresses here bore a close resemblance to the costumes of some of the Italian masks. The spectators were, besides ourselves, a crowd of Buraets and Mongols, and some Chinese merchants passing by. We all stood behind a railing erected for this

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purpose, in front of the stage, and at a moderate distance from it.

This portable theatre had been erected for the holidays only, by the side of a temple, which I now entered. It was very like that which I had seen yesterday, only that, upon the raised platform on which stand the idols, and behind the curtain which divides the building, there was a human, that is, not a deformed, nor, consequently, allegorical figure, in golden armour. Something of the same kind, it appears, is to be seen in all the temples of Maimachen; and the Russians assured us that the reigning Emperor is worshipped in one of them; so that it may be, that they are living heroes, who receive homage with the gods in the other temples, though only behind the curtain. In the temple in which adoration is paid to the Emperor, the divine service ends with a sentence which my informant thus translated, "May he live a thousand, and again a thousand years, the son of heaven." But it is possible that this interpretation falls short of the force of the original, which was, in all probability, nothing else than the "ten thousand times ten thousand years;" the expression of an attribute so usually and distinctly applied in China to the reigning Emperor, that it serves to designate him as clearly as the words *Thai tsing*, the Great tsing, the official style of the Manchoo dynasty. The Russians remark, respecting the title, which they render *Nebesnui suin*, "Son of heaven," that it has reference to a kind of metempsychosis; and that the Chinese believe of their rulers, as the Mongols of their Dalai-Lamas, that each of them inherits the gifted or inspired soul of his predecessor.

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CHAP. XL

ODOUR OF THE CHINESE.—MANNERS OF THE MERCHANTS.—INSCRIPTIONS ON THE SUNDIAL.—INTERPRETATION BY THE CHINESE.—M. SCHOTT'S REMARKS.—MAGNETICAL OBSERVATIONS.—CLIMATE OF TROITSKO SAVSK.—TEMPERATURE OF THE SPRINGS.—CHINESE PHYSICIANS.—RETURN TO MONAKHONOVA.—INVITATION FROM THE KHAMBA LAMA.—APPEARANCE OF THE LAMAS.—RIDE ACROSS THE STEPPE.—THE CONVENT.—THE MUSIC.—THE KHAMBA LAMA.—BUDDHISM OF THE MONGOLS.—ASTRONOMICAL THEORY.—THE TEMPLE.—FORM OF WORSHIP.—THE BURAET WOMEN.—THE TANGUTIAN BOOKS.—IDOLS.—MONGOLIAN WRITING.

On my return to Kiakhta I paid a visit to M. Kotelnikov. On this, as on several other occasions, I perceived, the instant I entered the house, by a peculiar smell, that Chinese were in it. Persons who have been shifted from one part of the earth to another, suddenly enough to seize their specific characters, without any gradual transition, have spoken of the smell of a country, or a national odour; and I perfectly understand what they mean, since I have myself met with several examples of it, as, in the first place, on my arrival in Russia, and again here, on the frontier of China, where even a blind man would be aware that he had left the precincts of Siberia and Russia. To the odour of Maimachen, undoubtedly, the pastilles in the Mongolian chapels and the fumes of the Chinese powder contributed not a little; but in a much more essential manner the Chinese themselves, every one of whom diffuses around him an atmosphere which brings to mind the strong smell of the leek. I can scarcely believe that this is due, so

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directly as the Russians assert, to the quantity of bulbs of this kind which they eat; the peculiarity would not, in that case, be perceived, as it is here on the frontier, in the case of every individual, at all times, and on every thing that comes in contact with him. This, and many similar observations, rather serve to prove that the exhalation of the human body assumes in different nations a constantly distinct and transmitted character, independent of those individual distinctions which every dog is able to recognise in the exhalations of his master. It still remains for the chemist to explain the nature of these exhalations.

The merchants of Maimachen, who had called on M. Kotelnikov to transact some business, were now sitting very comfortably along the wall of the great room, smoking their pipes. One of them offered me his pipe, another his snuff bottle. The Chinese use a snuff, ground very fine, in lenticular bottles, of about an inch in their greatest diameter. In the cylindrical neck is screwed a stopper, to the under side of which is fixed a small spoon, which reaches into the interior of the bottle. With this spoon they put a little of the snuff on the thumb nail, and so carry it to the nose. These snuff-bottles are either cut out of hard stones, or made of green or ruby-coloured glass.

When the Chinese guests were told that I was just come from the Phusi, or magazines, they expressed their curiosity to see what I had purchased; and made thereupon some playful and shrewd remarks, partly in their broken Russian, and partly among themselves in Chinese, the import of which was explained to me by the people of Kiakhta. They were amused to think that a tsian, or European, would decorate himself with Chinese finery; and they pointed out some articles intended only for women, and which they affected to suppose I must have carried off as a love-token for one of my female friends. The sun-

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dial, above described, then caught attention, and they showed some pride in endeavouring to unfold to me all the ingenuity of its contrivance. I questioned one of them respecting the inscriptions on different parts of the instrument. These were—1st. Four words, monosyllabic as usual, and arranged in a horizontal line on the lid of the case, which was also further embellished with the figure of some plant. 2dly. Two lines, consisting of eight signs or syllables, and arranged vertically on the bottom of the case outside. 3dly. Four syllables, standing round the divided circle of the compass in the interior of the box.

Only the first two of these inscriptions were considered in our conversation in Kiakhta, and I wrote down, in the first instance, the sound of each syllable as the Chinese merchant pronounced it, and then his interpretation of it. Since my return, my distinguished friend, M. W. Schott, of Berlin, has examined these interpretations, and finds that the merchant's pronunciation differed from the literary standard no further than may be easily explained by the variety of provincial dialects in China. But with respect to the meaning of the words, on the other hand, I have observed, with surprise, that the explanations of the merchant of Maimachen do not bear the least resemblance to those given by M. Schott!

If our object were merely to understand what was meant by the author of those inscriptions, I should be satisfied with giving, at once, my learned fellow-countryman's version of them. But the earlier version is remarkable in another point of view, for it offers us an example, which can hardly occur anywhere but in China, of a man reading his language rightly, and yet mistaking its meaning.

The first of these inscriptions is written in red characters, and is read—

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By the Chinese.	By M. Schott.
tschi	hi
fo	ho
tin	tsching
se	sui

The explanation given by the former was, that this was the proper name of the maker of the sundial; but M. Schott, on the other hand, translates the sentence thus:—"Hi, Ho, makes (or make) the year;" on which he remarks that the syllables Hi and Ho, which always go together, are the name or names of one or two Chinese astronomers of an early age, who were honoured by posterity as the drivers of the sun's chariot, in consequence of their having determined the length of the tropical year.

Still more singular appears the difference which I found in the interpretations of the two vertical columns at the bottom of the case. The lines follow one another from right to left, and the words from top to bottom. They are pronounced according to

The Chinese interpreter.		M. Schott.	
fo	sen	fang	sin
siu	ga	sieu	ngan
soi	sio	schui	hieu
tschi	dji	dshi	i

The Chinese explained the first line, literally, thus:—"A new thing—let it be well packed;" and the second as follows:—"A quadrangle (quadrangular box) for beaux (or fine gentleman)." Whereas M. Schott finds, in the same lines, nothing more than the words, "Made by Fang-sieu-schui, of the village of Hieu, near Siungan."

The horizontal row of characters in the interior of the case, to which I did not call the attention of the Chinese merchant, signifies, according to M. Schott, "It knows the region of the heavens, and adapts itself to (*i. e.* determines) the time." As to the figure

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of a plant, which stands above this inscription, M. Schott conjectures that it represents the plant, which, by some peculiarity in the period of its shedding its leaves, is said to have suggested to Chinese astronomers the expedient of regularly recurring intercalary months.

The characters marking the quadrants round the compass, are pe, nan, tung, and si; or north, south, east, and west.

Now, with respect to the very erroneous explanations of my Chinese informant, I must observe, that his serious manner, and looks expressing entire conviction, were such as forbid me to entertain any doubt of his good faith and sincerity. He offered me the pipe of peace so good-naturedly, and expressed so much pleasure at my curiosity respecting the learning of the Chinese, that, when appearances were so strong against him, I could not help feeling convinced that the Chinese words under consideration are equivocal, so that to a man not conversant with the language of astronomy, they might occasion misapprehensions of a kind more or less excusable. The grounds of such misapprehension are, in fact, plain enough. M. Schott has informed me, that the word *fang*, which he, in conformity with astronomical phraseology, has rendered, in the third inscription, by the words "regions of the heavens," signifies, in its primary sense, a *quadrangle*. Now, the same character occurs in the second inscription, where the Chinese, reading it *fo*, actually explains it to mean a quadrangle; while M. Schott reads *fang*, and takes it to be a proper name. In consequence of this remark, I begged of M. Schott to look after the ambiguities which might occur in the first and second incriptions, so that the sincerity, at least, if not the knowledge, of my friend in Maimachen, might be set in a fair light. The result of that obliging and learned scholar's pains to

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clear up the matter, I shall now venture to communicate in an extract from his letter:—

"In the case of the words *hi*, *ho*, *tsching*, *sui*, or, according to the provincial pronunciation, *tschi*, *fo*, *tin*, *se*, the historical allusion evidently escaped the notice of the Maimachen interpreter.* Yet he was right enough in regarding *hi ho* as a proper name; and as he also read correctly the word signifying *make*, he may perhaps be pardoned for his rounding off the phrase, by making *sui* (or, as he pronounced it, *se*) signify a *measure of time*, instead of a *portion of time*, or a year. Thus he arrived at the result, 'Hi-ho makes sundials,' instead of 'Hi-ho made the solar year.'

"In the vertical column to the right, which signifies 'Siungan, from the village Hieu,' but which our Chinese renders by, 'A new thing—let it be well packed,' the first word, *siu*, or *seu*, when taken as an appellative, signifies *new*. The second sign, *ngan*, or *ga*, signifies, when taken appellatively, quiet, or peace. The third has a meaning akin to that of the second; and the last signifies nothing but a small town, or village." Here, then, I think that my Chinese friend's mistake is not wholly unexplained; for, to the mind of the merchant were presented in order the ideas, "new," "quiet," "place," which he, accustomed to the somewhat loose paraphrasing of his

* With respect to this historical allusion, M. Schott makes the following remark:—"Hi and Ho (or otherwise Hi-ho), are frequently mentioned in the work translated by Gaubil ('Le Chouking,' Paris, 1778). In Bayer's Museum Sinicum (St. Petersburg, 1733, tom. ii. p. 235.) also, their merits are stated in these words:—"Annis 360 et amplius post cyclum institutum duos astronomos Ho et Hi commemorant, quibus adjutoribus Jaus (Jao) rex demum 12 menses lunares, sex 30 dierum et totidem 29 dierum, menses deinde intercalares ordinaverit. Hi ducum dignitatem consecuti, ad seros nepotes decus suum transmisere." Father Gonsalvez, in his Arte China, cites the following device, resembling that on our dial; Hi-ho-king-sheu-yin-shi, the literal sense of which is, "Hi-ho sagely taught men the times" (*i. e.* the divisions of time).

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almost hieroglyphical language, converted into "something new, in a quiet place;" and this again, on second thought, and with the exercise of a little ingenuity, took the more distinct form of "A new thing—let it be well packed." M. Schott is confirmed in his interpretation, given above, inasmuch as, with the Chinese, the name derived from the place of birth always precedes the personal name.

Still more pardonable, as it appears to me, was the merchant's mistake with respect to the second vertical column (on the left hand side) of the second inscription. In this case, such is the ambiguity of the words, that any one taking them for anything more than a proper name must be inevitably misled. But the Chinese could not expect to meet with the proper name in this place, since he thought that he had found it already in the first inscription. With regard to this column, M. Schott remarks, "It contains the character *fang*, the primary meaning of which is a quadrangle, although it must be translated in the first inscription, 'region of the heavens,' and in that before us, it is the family name of the artisan. The surname which follows, sieu schui (provincially, *siu soi*), consists of two syllables, as is usual with this class of Chinese names. It is intended to honour its bearer, and, therefore, we need not be surprised if its meaning actually were 'a beau,' or 'fine gentleman.' Morrison's dictionary is far from containing all the Chinese compounds; it wants, for example, this sieu-schui; but, on the other hand, that writer has given the compound word sieu-khi, literally the perfume of flowers, and which he renders by *elegant, subtle matter*, and *fine person*. Sieu-schui means, literally, flower water; and it is by no means unlikely, that, in the language of common life, it has the same metaphorical acceptation as sieu-khi, or flower smell, and consequently, that it means an exquisite or fine gentle-

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man. The fourth sign of the column (dschi) is the usual expression, for working or making." From all this, it appears to me evident that the Chinese translator read very consistently, in his own way, the words, quadrangle, fine gentleman, made; from which he framed the sentence, "a quadrangle made for a fine gentleman." The cubical form of the instrument, and its elegant covering of embroidered silk, might help to confirm him in his interpretation, and carry him away from the true meaning, "Fang-sieu-schui made it." At all events, these details appear to me well calculated to make us Europeans sensible of the superiority of our alphabet, of some two dozen letters, and of our uniformly constructed languages, to the thousands of different signs, the eight kinds of writing, and four styles of the Chinese; and, at the same time, to inspire us with respect for the sagacity and perseverance of those of our own country, who wander in that chaos, with more safety even than native Chinese who have received the best mercantile education.

With respect to the pronunciation of my Maimachen friend, I owe to M. Schott the following remarks, "I will not venture to deny, that he read correctly in his own way; for every native of the middle kingdom, who is not of the learned class, reads, if he can read at all, in the provincial dialect of his locality, and these dialects are without number. Besides the Kuan-hoa, which is the High-German (the cultivated language) of the Chinese, I have a tolerable knowledge only of the dialect of Canton; and it is remarkable that your Chinese friend pronounced some of the words of the inscriptions exactly as they are pronounced in Canton."

The Chinese whom I met with here, had in general black and decayed teeth. The great care which they bestow, in other respects, on personal beauty and ele-

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gance of appearance, makes this defect more striking. I suspect its chief cause to be the solution of copper, produced by the empyreumatic oil of tobacco in the bronze mouth-pieces of their pipes.

February 20, 21. — The geographical and magnetical observations which we made in Troitsko Savsk, at the house of M. Ostrovski, were particularly interesting, as they proved, in conjunction with former results of this journey, that in the valley of the Selenga we had crossed a second time the line of no declination. At the place where we first came upon this line, between Osàblíkovo and Doskino (see Vol. I. p. 104.), its direction was from north-west to south-east; here, on the other hand, it was from south-west to north-east: and the observations which we had made between these places, when taken together, proved that the two portions, thus differing in direction, belong to one and the same line. The hypothesis that the Asiatic continent is crossed by two lines of no declination, which some philosophers had advocated just before our journey, was refuted by the establishment of this fact; as well as the unfounded doubts raised, on the same occasion, and in favour of the erroneous hypothesis, against some of the observations of declination made by Billings. Equally important, for the ends we had in view, was the determination of the magnetic intensity on the Chinese frontier, for here we found ourselves at the most southern point which we reached on the Asiatic continent (lat. 50° 21′ 5″ N.); but in consequence of our continual approach, at the same time, to the Siberian magnetic pole, the magnetic force here was equal to that which is found under the eighty-second parallel of latitude in the meridian of Berlin.

I have already mentioned the general agreement which manifests itself in Northern Asia, between the lines of equal magnetic force and those of mean tem-

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perature; and, according to that, we had to expect an increase of cold here also, as we continued to proceed eastwards in one and the same parallel. Our experiments to ascertain the mean temperature of Irkutsk, were by no means at variance with this expectation; for on no meridian, situate between Europe and Lake Baikal, had we observed a climate so cold, for the latitude of 52°·16, and an elevation of 1240 feet above the sea, as that of Irkutsk. As a test of these results, the meteorological conditions of Troitsko Savsk were of the greatest importance. To M. Ostrovski and Staff-surgeon Petroy in this place, I owed some general accounts of the local course of the weather; and these accounts confirmed the conclusions I had already arrived at respecting the deficiency of atmospheric humidity, and the prevalence of the winds blowing in the meridian, over those in the parallels of latitude. The east wind is the least prevalent of all. During our stay here of six days, there was a frequent alternation of north and south winds; and the sky, with the latter, was always dark-blue, but grew whitish as soon as the north wind set in. The humidity of the air also increased with this wind, as well as the likelihood of a shower of some kind, and also the quantity of water contained in the column of air above Troitsko Savsk. On the 20th of February, the wind being from the N.N.E., and the sky whitish, there fell some snow in flakes of extraordinary fineness. Yet the air, at the earth's surface, contained at that time but two-thirds of the water which it was capable of holding at its temperature of —16° R.; the fine snow which fell could not, therefore, have originated in that stratum of air, but must either have come from a great height, or have been blown from a distance. According to the indications of a hygrometer (of De Saussure), the column of air above us could have yielded, when there was a S. S. W.

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wind and a blue sky, 1·8 lines of water; and on the day when it snowed, 4·8 lines, on the surface of the earth, if the humidity in suspense had fallen completely. But in summer, and in moist situations, there might be a fall of twelve inches of water on the same conditions. In order to produce this feeble effect, the entire column of air would require to be cooled, on the first day, from —20° to —27° R., and from —16° to —21° on the other days. Long series of observations of temperature had not been as yet made here; and it was, therefore, the more necessary to supply their place by ascertaining the temperature of the springs.

On the 20th of February I set off for this purpose to a great reservoir upon the Chinese borders, on the eastern side of Kiakhta, to which the camels are driven to drink. It proved to be a quadrangular pond, a few feet in depth, and I have no doubt that it is fed by springs, as the people state, which issue from the bottom of it. Nevertheless, it was not to be used for observations of temperature; for it was closed with a dam of earth, known in Kiakhta as the lower dam, and was consequently covered with ice. The boundary line, along which we passed in the vicinity of Kiakhta, is marked by a row of chevaux-de-frises. On the Chinese side of it we saw seventy-five camels, unloaded and turned loose, which were cropping eagerly, one after the other, the dry and frozen grasses. Altogether the camels offer a singular example of endurance and pliant nature; they dread the rigorous winter here as little as they do the scorching heat in the sandy steppes. The only danger they know is in the change from frost to thaw, and from thaw to frost, when they happen to be in a country covered with snow. The sharp ice, which is then formed on the soft surface, cuts their feet; as has been observed, too, in Europe with respect to the deer and

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roebuck. In colour these camels seemed to vary as much as other domestic animals. I saw, with the Buraets and Chinese in Kiakhta, several that were snow-white; but had, at the same time, eyes of the usual colour, and not reddish, as might have been expected from the examples of mice and other animals affected with albinism.

On the following day I found other springs, perfectly adapted to furnish the particulars of temperature correctly. They form, in a somewhat narrow valley, a branch of the rivulet which falls into the Selenga at Ust-Kiakhta. One of them, which gushes from the precipitous bank into the open air, had a temperature of +1°·4 R.; and I found the same temperature lower down, where the icy covering of the shallow brook was interrupted by springs, which issue from its bed, visibly throwing up the sand.

The Russian physician in Troitsko Savsk related to us some curious facts respecting his Chinese professional brethren who come occasionally to Maimachen. One of them cured a Russian, who, it was thought, could be saved only by the amputation of one of his legs, by acupuncturation; and thus, it appears, that this expedient was habitually employed, not only in the steppes of Barabinsk against the Siberian plague, but also by the learned Mongols, earlier than in Europe. Another Chinese succeeded in healing an inflammation of the neck, after it had been pronounced fatal by the Russian doctors. This was effected by the copious use of a potion, the composition of which remains unfortunately unknown.

With respect to the Holothuriæ, which we ate at the table of the sarguchei, it still remains to be observed, that they are here called, by the Russians, improperly, Karakatiza; for if we adopt this name for them, we must consider them as Sepiæ or cuttle-fish. This mistake, however, is very excusable in the mer-

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chants of Kiakhta, as they know nothing of the Molluscæ but from species found in the sea of Okhotsk, and which they may occasionally see alive, while their neighbours of Maimachen procure the supply for their tables from the seas round the Marianne Islands. This distant origin was easily recognised in the case of the dried Holothuriæ, which I obtained from the kitchens of the Chinese. They were strung together, like the pieces of a necklace, with a brown cord, made of the filaments of the cocoa-nut, which certainly reach Siberia in no other way than this. The oval-shaped animals are bored through in the direction of their least diameter, so that they lie lengthwise parallel to one another. The hole pierced through them, and the cord that fills it, have a diameter of five lines; while the animal itself, in its dry state, is only seven lines wide, and two inches long. But the living individuals are much larger ; and, even in the dry state, they double their dimensions when well steeped in water. When boiled for some time they yield a well-flavoured and abundant jelly, which is very salt, however, whether owing to the particles of sea-water retained in it, or to the animal itself. It is coloured brown also by the pigment of the outer skin. The muscular substance, or meat, which remains after extracting the jelly is tough, and tastes not unlike veal.

February 22. — We left Troitsko Savsk about nine in the morning, and went, on wheel-carriages, at a rapid rate down the mountain to Ust-Kiakhta. There we again resumed our sledges, and proceeded for fifty versts as far as Monakhónova, on the ice of the Selenga ; the broad valley of which is bounded on its left, or western side, by rugged rocks split into every variety of figure.

In the post-house of Monakhónova we found four lamas or priests of the Buraets, who were come to

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bring us greetings, and an invitation from their chief, the Khamba lama. Moreover, through the friendly attention of a magistrate of Udinsk, a subaltern officer of the Tunguzian Kosaks had come from Selenginsk to meet us, to serve us to-day, and during our visit to the lamas to-morrow, as interpreter. The lamas wore pointed hats of bright yellow stuff, and wide robes of scarlet cloth. To this showy and elegant clothing, they united fine figures, and a carriage so vigorous and active, that, in Europe, they would have been taken for warriors rather than for priests. The Russians here said, that there was hardly a Buraet family of which there was not one member at least in the priesthood. They talked much, also, of the strict discipline which the lamas inculcate. Our subsequent inquiries confirmed the fact, that they renounce marriage, and all intercourse with women. It was also maintained here, that they are strictly forbidden to taste any spiritous liquor. Towards us they manifested a dignified and perfectly disinterested behaviour; for three of these messengers who were about to return to the Khamba lama this evening, refused very decidedly to accept a few presents which we offered them merely to acknowledge our sense of their civility, and of the trouble they had taken on our account; but they repeated that, as representatives of the high priest, they could accept no gift. Our interpreter, too, was a man of respectability and station; he told me that he belonged to the Tunguzian ruling family of Gantimur, whose right to the title of prince had been acknowledged and sanctioned by Peter the Great.

The followers of Chigemúne begin their year with the month which they name after the panther (in Russian and Mongolian, *bars*); it coincides with the White Month of the Chinese, and was about to be celebrated on the following day, when we were invited

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into the steppe, by a solemn service. We remained for the night, therefore, in Monakhónova, where I made some astronomical observations. The atmosphere was, this night, pure and transparent, to a degree never seen in any other region.

About eight in the morning all the preparations were complete for our journey to the Khamba lama. The ground over which we had to go to the steppe, which lay westwards, was quite impracticable for sledges, and two tilegas were therefore brought for us, or wooden post-cars of the same kind as those of Ust-Kiakhta. I preferred the saddle, and the lama who had remained with us, Prince Gantimur, and a Russian farmer of Monakhónova, to whom the cattle in the tilegas belonged, were all on horseback. Our saddles and bridles were abundantly decorated with steel studs; and the horses, of the Buraet breed, showed on this occasion the same fiery spirit which I had previously observed in them. The sky was again of a deep blue colour, without a trace of cloud, and the air perfectly still.

Monakhónova is situate on the left and more elevated bank of a feeble affluent of the Selenga, which rises towards the N.N.W. from this place, in what is called the Goose Lake. The habitation of the Khamba lama lies, we are told, near the southern side of this lake. We rode at first down to the ice of the river, which is partially environed with reeds, and in the dry season disappears altogether: we followed it for some time to the north-west, then, as the glistening ice began to stretch northwards, we struck off towards the west into the steppe. Before us lay a perfectly level and widely-extended plain. Towards the west and south-west only it was bounded by lofty blue mountains, as if with a wall. Round stones, sometimes of the size of the fist, but generally much smaller, were strewed thickly on the ground; they

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consist of dark brown feldspath porphyry, like the mountains of Monakhónova; the pieces are often very porous, and may possibly constitute a transition to the true lavas; which, according to M. Ostrovski, make their appearance in the mountains to the west, at a place thirty or forty versts distant from the seat of the Khamba lama. On the sides of the Blue Mountains we saw streaks of snow, but the ground round about was perfectly bare. Between the stones stand dry tufts of grass and other plants, now turned yellow, on which the horses, cows, sheep, and camels feed in the winter. We saw several droves of horses wandering over the open plain; they galloped off whenever our noisy train approached: and even their owners can catch them only with the lazo. The camels avoid the frequented parts of the steppe.

In many places the ground was cracked by the frost, and the deep clefts crossed one another in many different directions. I had seen cracks of the same kind in the snowless valley between Troitsko Savsk and Kiakhta, and also at Obdorsk, on the driest parts of the elevated bank of the Obi.

We rode fast over the favourable ground; the lama held the lower ends of his flowing robe folded round his knees, and was always the first of the whole troop in the gallop. Learning and spiritual dignity seemed to be gracefully united in this instance with the accomplishments of chivalry, and the saddle appeared to be an indispensable step in the course of refinement. Gantimur said that we had come twenty-four versts, just as our spiritual attendant pointed westwards to the house of the Khamba lama, and the temple and chapel at its side. We rode the last verst in close array, while our cars, with loud jolts and sounding bells, followed in the rear.

We halted then before a most extraordinary scene, and the most singular company that can be imagined;

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we were at one end of a regiment of men who occupied, in two parallel lines, the way to the house of the high priest. They were lamas, who all wore the same kind of scarlet clothing, with other bright-coloured articles of dress. Striped pennons, and large flags in number waved between the lines. I shall never forget the effect of these brilliant colours, contrasted with the background of the glistening snow-clad mountains, and the azure sky of the Sabaikalian region.

When we had dismounted, and gone between the ranks of the priests, there began a strain of music, as overpowering as it was peculiar; every one of the lamas contributed something towards it: and we now saw with them gigantic kettle-drums, carried on four wheels; copper trumpets ten feet long, the anterior end of which was rested by the performer on the shoulders of a man standing before him. There were horns of all shapes and sizes, brass gongs, and bells; cymbals, wooden drums, triangles, and many other instruments. As in the Chinese music, so here, an andante of brass horns and kettle-drums, was followed by a Bacchantic allegro of all the instruments. But the concert at Maimachen was but a trifle to that performed here, in which the grave prelude of the wind-instruments was like a roaring hurricane, and the chorus of brass gongs, drums, &c. resembled the crash of a falling mountain.

Between the ranks of the drumming and trumpeting priests, the successor elect of the Khamba lama came forward to receive us. He stated, by way of apology, that the holy man was unable, from the infirmities of age, to come himself to meet us; and the truth of this was rendered apparent at once, when we saluted the Khamba lama at the steps of his wooden house: he was so prodigiously corpulent, that every motion must have been a labour to him. But in spite of this bodily grossness, the features of his dark brown

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face, and his calm self-possession, bespoke the cultivated man. He, too, like the rest of the lamas, wore a scarlet robe. We sat down with the high priest in one of his rooms, in which were several wooden presses or cabinets, by no means deficient in elegance; and some Chinese easy chairs. With the help of Gantimur, who served us as interpreter, we now commenced a very agreeable conversation.

To a question of mine respecting the relation which the religion of the Buraets in this place bears to the Buddhism found by the English in Ceylon and Nepal, and to that of the Chinese; the Khamba lama answered, that the worship of Chigemúne followed here, is exactly like the Buddhism of India, but that it has no connection whatever with the religion of Fo. He named, as an object of their worship, the mother of Chigemúne; but when I ventured to remark thereupon, that they seemed, therefore, to acknowledge more than one God, he replied, that this was by no means the case; that the Burkhans, whose images they set up in the temples, are like the saints in the Greek church, only teachers and instructive examples of men. I then asked if they reckon Con-fu-tse as one of these, and was answered in the negative. The Khamba lama seemed to have never heard of the Chinese sage. He told us, moreover, that the Buraets who are destined to the priesthood, are taken when children into the yurts of lamas, who instruct them in the art of writing and of reading the sacred books. These books they have got from Tibet, with their religious doctrines and usages collectively. Their sacred language — that of their ritual—he called the language of Tangut, and he added that, in the words and written characters it was totally distinct from the languages of the Buraets and other Mongols, the Tangutian being written in horizontal, the current Mongolian in vertical lines. Religious songs, and other

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compositions in this learned or sacred tongue, are printed here in the yurts of the lamas, with wooden blocks. The Buraet priesthood is divided into a great number of ranks, the Dalai lama of Tibet being at the head of all. Of the lamas here, none but the Khamba lama and the lama next to him in rank, are allowed to read every book they please. Some of their books may be read by such of the laity as have any taste for the study of them.

The Khamba lama confirmed to us what we had been told respecting the ascetic rules to which the priests are subjected; but reproved with an air of reserve the opinion which I expressed as to the inexpediency of the vow of celibacy. I afterwards learned from the high priest's Russian neighbours, that he labours under the suspicion of a domestic love affair; and it is just possible that he may have fancied there was some personal allusion in my jesting criticism. It is supposed, indeed, that his successor elect, whom he gives out to be his nephew, is in reality his son; and, in truth, a striking likeness between the two men, together with the strong inclination of the younger to corpulency, seems to favour that opinion. The future Khamba lama is named already during his predecessor's lifetime, and lives under the same roof with him till his death. This renders much more comprehensible an article in the Buraet creed; according to which the soul of the Khamba lama passes over into his successor, and thus confers on this high priest the same kind of immortality which is enjoyed by his prototype in Tibet.

We talked of the cosmographical and astronomical theories of the Mongolian priesthood; and, indeed, it was the Khamba lama himself who started this topic, having heard that we were travelling for the purpose of observing the heavens. He was ready to yield a partial assent to our doctrine, that the stars stand

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still while the earth moves; for, although the Buddhists suppose the earth to be on the back of an elephant, and at rest, yet they allow with us, that the diurnal motion of the heavens is but an apparent motion: they hold, forsooth, that the fixed stars are immovable and unchangeable luminaries, of which we see only the reflected images in flowing water, which goes round the earth. It is the movement of this water alone which gives the images of the fixed stars their apparent motion! We refrained from disputing this rather obscure theory, and asked the Khamba lama what he thought of the floods which the earth is said to have undergone. He replied, that the Tangutian books make mention of several cataclysms, some of which are past, some still to come. He knew nothing of any one who, like Noah or Deucalion, had survived such a catastrophe; and he manifested no satisfaction when I referred to the petrifactions as confirmatory of the Buddhistic statements: for his only answer was, that he had never seen fish of that kind in the rocks, nor had he read of them in his books.

Our conversation was broken off by the commencing of the sacred rites in the temple close by. The Khamba lama's successor accompanied us to this solemnity, at which the high-priest himself did not attend. The sacred edifices stand all together in a great court, encircled with a simple paling. The chief temple occupies the middle of the area, and round it are thirteen smaller buildings; in some of which religious ceremonies are performed, in others are kept the sacred furniture and utensils. All these edifices are built of squared balks. They consist, generally, of several parts or rooms of different heights, over which, without regard to union or symmetry, is reared a jumble of pyramidal and variously intermingled boarded roofs.

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The ground plan of the chief temple forms a rectangle, the longer side of which supports a colonnade externally. A few steps lead to the raised floor of the colonnade; while a broader and covered flight of steps, at the narrow end of the building, conducts into the interior.

Ascending this flight of steps, we entered at first a square antechamber, variously and brightly decorated, and then passed into what might almost be called a Gothic church. A broad nave in the middle is separated from a less elevated aisle, on each side, by a double row of pillars; and in the middle of the church the main nave rises to an elevated and flatly roofed cupola. The square columns bear broader capitals of the same form, with carved and painted ornaments; and some hundreds of pictures hang on the side-walls of the church, in the cupola, and on the northern wall, in front of which stands the high altar and the table for offerings. The temple was well lighted by numerous windows in the aisles.

Benches, covered with voilok, are placed between the pillars of each of the four rows; at the north-end of the two middle rows, are four cushioned seats, a little higher than the rest, at each side of the high altar; at the northern wall, is a chair like a throne, beneath silk hangings. All these places were occupied by priests, when we entered. In the aisles sat the inferior lamas, pressed close together; in the main nave were those of higher rank, and on the divans at the north end, were the priests who performed especial parts of the service. Of the canopied seats, one, which belonged to the Khamba lama, was unoccupied, in the other sat a priest who was entitled *Tsorja lama*. He kept an eye on the ranks of the other priests, and directed with signs the course of the solemnities.

Here, again, all the robes were of scarlet cloth, all the head-dresses of bright, yellow stuff, but differ-

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ently shaped, according to the rank of the priests. The principal lamas had hats which seemed to be faithful copies of an ancient helmet. On the crown stood a crest-like frill, and behind was a flap covering the neck, and with its convex side turned downwards. The hats of the inferior priesthood, on the other hand, had brims all round, and rose in pointed cones, like the common Buraet hat.

The service began with music, to which every one of the two hundred lamas present contributed his share. The instruments were, on this occasion, more various even than at our reception. The enormous trumpets, the brass horns, the kettle-drums and gongs, were now at work, as before; but, besides, there were several lamas blowing the gigantic conch (*Tritonium variegatum*, Cuv.), which is used by the inhabitants of the South Sea Islands to sound the alarm of war. Many others beat timbrels of various sizes, which they bore fastened to belts round the neck. I observed, also, in the back row, on the west-side of the temple, a lama who was playing a set of bells. This consisted of a quadrangular frame, standing upright; three cords were stretched across it in parallel lines, and from each of these hung three bells, which were struck by the priest with clappers. The lamas on the cushions near the altar were alone without instruments. At the beginning of the service, they sang, or rather chanted, in recitative, with a deep bass voice, and in slow time, verses or portions of prayers, which were accompanied with instrumental music. The trombones and deep-toned horns predominated in this grave recitative, until, at the conclusion of the strophe, all the lamas joined in an animated and indescribably impressive chorus. All now recited together in an abruptly divided measure, and, between every two syllables, each performer sounded a note of his instrument in such a way as to

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enhance the emphasis of the words uttered. The building shook with the sound of the voices and brass instruments.

Responses of this kind, or in alternate recitative, were frequently repeated, and when the chorus was to join in, the superior lamas gave a sign with little bells, as is also the custom with the Roman Catholics. Before the Tsorja lama there lay, for the purpose of calling attention to the principal portions of the service, a small drum or rattle, with a handle, and filled with sounding bodies. The peculiar rattle of this instrument was heard clearly above all the rest. The Tsorja lama bore also, for the same purpose, a short brass truncheon, with oval and ornamented ends. This he held in the middle like a marshal's staff, and seemed to direct by its motions the priests near him.

During a pause in the chant, he took a bowl filled with corn from the table before the altar; with this he proceeded through the middle alley of the temple, and gave each of those sitting there a handful of grain. Then the music and singing began anew, and after a few verses, all, at the same time, threw the grain into the air, so that it fell in a wide curve, just as if they were sowing a field. The corn served again for another symbolical ceremony. A number of priests, going one after the other, marched through the middle nave and eastern aisle of the temple, each of them bowing, as he passed, to the table of offerings, and touching with his forehead the bowl of corn; then each stopped before one of the sitting lamas, and again received from him, out of another bowl, a handful of grain. This ceremony necessarily reminded one, at first sight, of the Christian communion; and the resemblance was increased, till it became almost illusive by the solemn chant, with which the lamas accompanied the march round the temple,

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and which was hardly to be distinguished from one of our old chorales.

During all this part of the service, the lamas seated above had their helmet-shaped hats hung up behind them over their cushions; but towards the end, they all covered their heads, and executed a grand and impressive finale. The lamas have no tails or tresses like the secular Buraets, but wear their hair cut close all round the head.

The men and women of the district subject to this numerous priesthood, take no active part whatever in the performance of the religious service. They stood in rows, one behind the other, at the smaller end of the temple, towards the entrance. The women and girls were very richly and uniformly dressed. They all wore gowns of blue silk, and round the forehead and in their tresses, they displayed those costly chaplets of malachite, red coral and mother of pearl, which I have already mentioned. During the performance of the service, all the people had their hands joined, just as in the attitude of praying in Christian churches.

It was not till the service was over, and the lamas had left the temple, that the eye was sufficiently at ease to discern the details of the incredibly variegated and dazzling decoration of the interior of the building. Above the altar, at the north end of the middle passage, were hanging, beneath a silken canopy, the portraits of Chigemune, of this prophet's mother, and of some other saints.

Then came a curtain, and between this and the small end of the building, lay thousands of Tangutian books, piled up, one upon another, from the floor to the ceiling. Each of them consisted of loose leaves, tied between two boards, and wrapped round with striped cloth. Sacred candles, made of butter, with cotton wicks, were burning on the altar; and here, as

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in Maimachen, there stood near the candles a wooden trough, in which was collected the ashes of the wicks. Near these were glimmering some Chinese pastilles, and other kinds of incense, in brass vessels. Bronze basins with consecrated water, such as we had seen on the domestic altar of a Buraet yurt, stood between the lights.

The offerings lay on a separate table before the altar. The bowls with corn, already mentioned, contained also the seeds of a plantanus and other plants of the steppe. Besides these, large blossoms and other pretty objects, imitated in butter, formed a considerable portion of the gifts.

It would have been to no purpose for us to guess or to inquire the meaning of the sacred pictures with which the walls around were covered. We saw among them allegorical, or only semi-human, figures with wings, beasts' heads, several pairs of arms, and such other additions; and also figures of men praying, with their hands joined, and sitting on their heels. These all had the simple conical mitre of the Indians, such as the Khamba alone of all the lamas at this place wears, and a circular glory round the head. In this allegory, too, as in the details of the ritual, we discovered, involuntarily, a close resemblance between the Buddhist mythology and the Catholic legends. But the study of the Tangutian books can alone decide, whether we must in this case look for an explanation of the fact to the early influence of the Nestorian Christians on the Mongolian tribes, or to the close vicinity of the sources of the two creeds, and the numerous ways by which the traditions and usages of Southern Asia have reached Europe even in later times. Our painters would probably rather trace the glories round the saints' heads to an imitation by the Byzantine school of Buddhistic images, than continue to believe, as hitherto, that they origin-

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ated in the *nimbus*, with which the sculptors of classical antiquity protected the heads of their statues from the dung of birds.

I was particularly struck here with the extraordinary frequency of a painted figure, which appears to have wholly escaped the notice even of the Russians acquainted with the language and manners of the Mongols. At the back part of the temple were lines hanging from the ceiling, and close together, on which were strung an immense number of thin panels, all cut into the shape of a head. They were painted all exactly alike, with a face having a dog's snout, two deeply set eyes, and in the middle of the forehead a black round mark, which either represented the pupil of a third eye, or else a scar from a wound. From the chin, a bunch of variegated ribbons hung to each panel, so as to form a beard. M. Igumnov, of whom I subsequently made inquiries respecting this singular effigy, had never seen it in the temples, but he confirmed my conjecture that the Mongolian mythes make mention of beings exactly resembling the Cyclops of the Greeks.*

Still more attractive than these effigies, were the heaps of the natural productions of Southern Asia; for these prove in the most decisive manner the uninterrupted communication of the lamas with Tibet and with India. Great elephants' tusks and gigantic sea shells were to be seen set up in different parts of the temple, and on the pillars were hanging the skins of tigers and leopards and plumes of peacocks' feathers. The ante-chamber, also, or porch of the temple, is filled with spoils of the same sort from warmer climates; and there are standing there, among other things, like sentinels, at the threshold of the sanc-

* According to the Homeric Myth., the chief Cyclops had, instead of an eye, a mark on the forehead, as in the Buddhistic idols.

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tuary, a perfect tiger and a lion, stuffed in a very elaborate manner, and true to nature. Before we quitted this chamber, we asked respecting the use of a singular looking piece of machinery in the middle of it. A hollow cylinder, about six feet high, is pasted over with paper, on which prayers are written in Tangutian, and by means of two pins may be turned round on an upright axis. Bunches of ribbons and pictures adorn the upper end of this sacred whirligig, and two arms, projecting from the cylinder, strike at every revolution bells placed on both sides. We learned from the lama who attended us, that this machine is intended for the ignorant laity, who can neither read their prayers nor commit them to memory. Such people do a meritorious work, if, as they quit the temple, they set the machine in motion, and count the proofs of their zeal by the ringing of the bells. This reminds us of the Roman Catholic practice of counting the rosary, without uttering the prayers at the same time. The lamas themselves use, for the purpose of counting the prayers which they actually repeat, a string with 108 beads, called *erikhe*, and held, exactly like the Christian rosary, in the right hand, while the left counts the beads.

Of the adjoining buildings, near the great temple, we visited but one; it contained a covered car, in which, as we were informed, the image of Chigemune's mother is carried on certain festivals. Seven wooden horses fixed to a board, under which are rollers, form the team yoked to this chariot. They are disfigured by green paint, but are otherwise made with a truth which might do honour to better known artists. The way in which they are placed and yoked is exactly that practised by the Russians, and there can be no doubt that the Buraet sculptors took their model from the carriages of their neighbours. The middle horse, which goes in the shafts, and under

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the bow (see Vol. I. 69.), is of the natural size, and has on each side three horses diminishing successively, so that those at the outside are but a fourth of the size of life. At the bow has been suspended, whimsically enough, in honour of the mother of God, the bell which serves to distinguish the imperial post-carriers. We were not, however, disposed to ridicule the ancient Tibetian religion; for although we thought that we could discern here and there some tasteless perversions and infringements made by the lamas, who get a living by them, yet we felt impressed by the chanting and the incomparable music in the temple, and by the holy rites, in which we could just trace an ancient relationship with the symbols of Christianity.

We then returned to the house of the Khamba lama, where we found assembled some of the young Buraet women, with their daughters, who had been attending at divine worship. The priests beckoned to the children, and gave them their hands to kiss. The women staid devoutly at the door of the apartment, and then took leave, with respectful salutation, at a distance. The Khamba lama expressed a wish to look at my journal, which I happened to have in my hand, to see our mode of writing; and, at the same time, he wrote for me, as a memento, his own name and title in the Mongolian cursive style. These consist of seventeen words, forming three vertical columns, read from left to right (and not, as in Chinese writing from right to left). But each column is read from top to bottom, as in Chinese. The writing of the high priest, who was probably not in the habit of using a lead pencil, has proved so illegible, that M. Schott has been able to decipher only the beginning of it, where it mentions "the temples situate to the south of Lake Baikal." The Khamba had decorated himself with a large gold medal, given to him

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by Alexander I., who had presented at the same time similar marks of distinction to many other chiefs of the friendly Siberian tribes. He expressed on this occasion the most loyal sentiments; and, as we were about to depart, begged us "to tell the Emperor, on our return to St. Petersburg, that the Buraets pray for him zealously and to the best of their ability."

It had been my desire to go, before we left the steppes, in search of the herds of camels feeding in them. The season of their heat had now begun, and one might therefore hope to witness their copulation, which very few intelligent observers have succeeded in doing. My guide, however, was unwilling to make the great circuit which would have been necessary for this purpose, and instead of that we returned, in full gallop, for it was now nearly dark, back to Monakhónova. We now mounted the horses, which had been previously yoked in the tilegas, yet they bounded along light and sure, as we rode them, by Gantimur's advice, with reins as loose as possible.

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CHAP. XII.

ENGLISH MISSIONARIES ON THE SELENGA. — THEIR LABOURS. — IDENTITY OF THE TANGUTIAN AND SANSCRIT LANGUAGES. — CORRUPT INFLUENCE OF THE MONGOLIAN PRIESTHOOD. — POLAVINA. — SNOWY MOUNTAIN OF KHAMAR. — LAKE BAIKAL. — CRACKS IN THE ICE. — ROCKS AT KADILNAYA. — DEPTH OF THE BAIKAL. — EARTHQUAKE AT IRKUTSK. — EXTENT OF THE SHOCK. — VULCANIAN CHARACTER OF THE BAIKALIAN REGION. — HOT SPRINGS. — MINES OF NERCHINSK. — ABSENCE OF COPPER. — VEINS OF TIN. — RELIGIOUS CODE OF THE BURAETS. — DOGMAS. — IMMORTALITY OF THE HEAD LAMAS. — STATE OF THE INFERIOR PRIESTHOOD. — SHAMANISM OF BURAET TRIBES. — ACCESS TO BUDDHISTIC LEARNING IN IRKUTSK.

February 24.—FROM Monakhónova we travelled in the evening fifteen versts to Selenginsk, and staid there for the night. In the morning we went from the town to the left, or opposite bank, of the Selenga, where three English missionaries, in the service of the London Bible Society, had been settled for some years. The two wooden houses occupied by them have a remarkably picturesque and pleasing appearance, at the very foot of the rugged and riven granite rocks, which there bound the valley. Of the missionaries we found but one, Mr. Robert Yuill, at home; the other two, the brothers Stanybras, had gone to the steppes on the Onon, to learn and to teach among the Buraets bordering on the Chinese. We were extremely glad to find that the plans of conversion were here to all intents and purposes abandoned, and that the missionaries were engaged chiefly in the zealous study of the Mongolian language and literature.

The English seem to have taken example from the wise tolerance which distinguishes the Russians, and

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which is here manifested as completely towards the civilised Buraets as to the ruder tribes in other parts of Siberia.

From the Russians, the indigenous tribes receive at present no further instruction than what follows from their being allowed to see the advantages of a moderate, and therefore to them not revolting, degree of industry. But it is never lost sight of, that the languages and manners of these nations are as completely endowed by nature with independence as those of Europeans; and that they ought not, therefore, to be eradicated, but observed and learnt. The Siberian Russians have found it advantageous in many cases to adopt the usages of the indigenous tribes, because, these usages being founded on long experience, they harmonise completely with the nature of the country and climate.

It is easy to perceive, that teachers, who see matters from this point of view, must necessarily renounce any direct attempt at religious conversion, and confine themselves to oral or written communication respecting conflicting creeds or tenets; and, in fact, this is all that the Russian priests in Siberia ever venture to do. With these moderate intentions, M. Iguminov established a school, as early as 1818, in Verkhnei Udinsk, in which he at the same time instructed the children of the Taïsh, or petty Mongolian chiefs, in Russian, and taught the Russian merchants the Buraet, and other Mongolian dialects. This, like all the other undertakings of the same distinguished man, originated wholly with himself, and from his love of knowledge. Consequently, upon the arrival of the English missionaries, M. Igumnov gave up that direct attempt: in the mean time the example of tolerance appears, as has been already observed, to have worked well on his successors.

Mr. Yuill informed us, that up to the present time,

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neither he, nor any of his colleagues, have baptized a single Buraet; and, moreover, that by order of the Russian Government, proselytes, where any present themselves, must join the Greek communion. On the other hand, the zealous English Protestants, had made themselves acquainted with the Mongolian and Russian languages, so that they were now trying to continue M. Igumnov's system of instruction. Mr. Yuill had already taught Latin to some of the Buraets; we also saw with him the complete MS. of an elementary work on geometry and trigonometry, in the Buraet language. There were a great many examples of calculations written in it in the Mongolian numerals, so that to complete the utility of this valuable gift, nothing more is wanted than tables of logarithms in Mongolian, and the printing of the whole. Furthermore, Mr. Yuill showed us a copy of the work, called in China, the Emperor's Book, which was printed in Pekin, in the thirteenth century. It was brought to Siberia by the last of the Russian spiritual missions, and is one of the most voluminous, but, without a doubt, the oldest, of what are called the royal dictionaries. It is arranged, not alphabetically, but according to logical principles, in chapters, rather arbitrarily divided; and contains for every Manchoo word, the corresponding Mongolian, together with a complete definition, in the Mongolian language. Mr. Yuill was at present engaged in extracting a Mongolian-English, and a Manchoo-English dictionary from this work. He previously bestowed a great deal of pains on the making of an index; for it was only by getting rid in this way of the Chinese logic, that the prompt finding of a word became possible.

Here we learned that the language, which the Khamba lama called Tangutian, and in which all the books of the Buraets, derived from Tibet, are composed, is nothing else than pure Sanscrit. The religi-

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ous language, therefore, along with the doctrines of religion, passed from Ceylon to Tibet, and thence to these steppes, through a distance of forty-five parallels of latitude. In proof of this statement, Mr. Yuill showed us a wooden block, in which were cut some lines of Sanscrit writing: he had got it from one of the Buraetian lamas, who was printing in his yurt, with this and other similar blocks, a new edition of what they call the Tangutian Hymns. In general the English missionaries find the Buraetian priesthood always ready to co-operate with, or aid them in their linguistic or ethnographical labours; but, on other grounds, they have conceived no very favourable opinion of that body. They confirmed our previous opinion, that the nomades of this country are extremely well-disposed and upright, but lamented that their morals were corrupted by the lamas, who, at present, form more than a sixth of the whole population which has embraced Buddhism. Celibacy has here the most prejudicial consequences, as the holy red-coats, not satisfied with seducing the maids in the yurts, convert the temples into places of assignation for the forbidden intercourse.

We left Selenginsk about five o'clock in the afternoon, and at eight o'clock reached the post-house of Arsencheva, on the left bank of the Selenga. The magnetic observations which I made there in the evening, and the following morning, gave perfectly regular results. The oscillations of the horizontal needle were slower, the dip was greater, and the declination more easterly than in Troitsko Savsk. But on the morning of the 15th of February, in the same place, Professor Hansteen had found the horizontal part of the magnetic force extraordinarily great (about $\frac{6}{100}$ greater than I ascertained it to be to-day); and even then suspected this phenomenon to have some connection with an unusual light which we had

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remarked in the heavens on the night of the 14th. Some bright whitish lines extended from the northern horizon to the zenith; but as the moon was then high in the heavens, we were unable to decide whether the appearance in question proceeded from thin clouds, or from an aurora borealis. The latter alternative has been now rendered very probable by the magnetic observations; and I mention the circumstance here in the hope that a northern light or its magnetic effects, may have been observed the same night in some other part of the earth.

February 25. — We proceeded, without halting, through Verkhnei Udinsk, and arrived to-day in the remarkable and romantic rocky district near the village of Polavina. Close to the town the rocks are stratified, and consist for a considerable distance of a coarse conglomerate, the strata of which incline to the S.E., and are therefore enclosed between the granite of the valley of the Uda, and the mountain chain of Polavina. The road further on continues along the left side of the valley, on which it gradually rises. The slope to the river is gentle at first, but on reaching the ridge of the granitic range, one sees the Selenga in a narrow glen at a great depth below; and opposite, on the other side, a high and rugged crest of rocks, which seem to separate two branches of the river. The Selenga takes here a turn to the west, and the narrow glen which runs to the right of the rocky crest, looks like a continuation of the valley, in which the river has flowed thus far. It is, however, a separate and independent valley, which joins that of the Selenga at a very acute angle.

In the glen coming from the north, flows the river Itanza: it rises in the hills near Lake Baikal, and here unites with the Selenga. At Polavina, a side-road leaves the great Irkutsk road, and leads along the Itanza to the hot springs of Turkinsk, which rise in

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the middle of the maritime tract at this side, towards Dauria.

Great blocks of granite still lie in the bed of the Selenga, for some versts beyond its turn to the west. Hills, with moss-covered fragments of the same rock, and with noble pine-woods, enclose the valley on both sides, nearly as far as Troitskoi Monastuir, where the sandy plain begins. There the woody hills still followed the direction of the road only on the left. There can be no doubt that this sandy plain once belonged to the bed of the Lake Baikal, which was at that time bounded by steep rocks in this place, as well as on the opposite coasts.

We staid during the night in Tarakónova. From this place I again took my dog on with me. He had submitted to his lot, and his restless wildness was now at an end.

February 26. — After we had left Tarakónova, and had got to some distance from the wooded hills, which lay yesterday on the left of our road, the lofty summit of Khamàr, covered with glistening snow, rose again into view in the south-west. During the forenoon the influence of this mountain on the state of the atmosphere was conspicuous. A fresh north wind was blowing over us from Lake Baikal, and this appears to be the current of air which precipitates aqueous vapour on these mountains. They were covered, on their northern side, with clouds in the form of the cumulus, which I now saw for the first time in Siberia during the winter. The sky around, however, was perfectly clear and of a deep blue, and these accumulated clouds on the mountains were to be seen passing off on their northern side into thin transparent cirri.

We reached the coasts of the Baikal at Posolskoi about three o'clock in the afternoon, and commenced immediately the passage over it to Kadilnaya. The

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crumbling of the ice into upright flakes (see p. 197.) extends for about a verst from the bank, then begins again the level glassy surface. We made a magnetic observation on the lake, when we got about ten versts from the shore at Posolsk. The ice afforded our instruments a perfectly firm foundation, and was at the same time more free than any rock could be from the suspicion of magnetic attraction. It is perfectly transparent, but traversed by perpendicular cracks, by means of which we were enabled to discern where the fluid and dark green water began, and to estimate the thickness of the ice at four feet. These cracks were all extremely narrow, and filled only with air. Many of them reached from the surface only to a certain depth, which was exactly the same for all, and seemed to be a third of the entire thickness of the ice. The other cracks then began at this depth, and reached down to the water. I remarked, moreover, that the planes which these cracks affect, intersect one another generally at an angle of 120°; so that both the upper and lower strata of ice are thereby divided into prisms, which have nearly the same kind of regularity as basaltic columns, but with a much greater breadth. It is evident that this separation must have taken place during the hardening of the ice; but that the congelation again took place at two different times, and instantaneously in the case of each of the two strata alluded to. It may be conceived that the uppermost layer of water cooled down considerably below the freezing point, and then crystallised suddenly and in a mass. The lower stratum of ice may have subsequently formed itself in precisely the same way, its different age being proved by its different system of cracking.

Quite different in look and origin from the cracks here described, were the much wider fissures, which are formed by the cooling and contraction of the ice

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subsequent to its perfect congelation. I found one of these at the place where we were stopping. It ran from thence to the north-east and south-west, with little deviation, to the horizon; it had throughout a uniform width of four inches, and reached from the upper surface to the water. It was filled with new ice, which gave it the look of a vein or dyke in rock. What added to this resemblance was, that the ice filling the crack was always much whiter than that of the surrounding mass; it was, in fact, traversed by fine cracks or flaws in a very regular and remarkable manner. One of these cracks formed a continuous and somewhat waving line, which was in the middle of the vein from the surface downward; and from that proceeded at a very sharp angle an immense number of smaller flaws to each side, just like the lateral ribs of a leaf, issuing from the central rib. This singular system of fractures seems hardly explicable. The mass in the veins must have been subjected to a great strain, owing to the great pressure under which the water was frozen, for immoveable ice on both sides resisted the dilation which attends the process of congelation. We staid for the night in Kadilnaya, on the coast of the lake.

February 27. — Here at Kadilnaya, and along all the road as far as the mouth of the Angarà, the environs of the Baikal remind one of the bay of Alpnach, in the lake of Lucerne. The rock consists of a coarse grained conglomerate, from which occasionally project round stones of the size of the head. It was of a bright yellow, and divided into thick strata, which have a very steep north-western inclination, and the cross fracture of which may be seen on the steep cliffs at the sea shore. A number of broad glens run down, through the rocky mass, perpendicularly to the coast, so as to divide it into colossal pillars and cones of the most abrupt forms. In these

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glens, alone, is to be seen a noble pine forest; between the feet of the precipitous cliffs and the ice of the lake there is only a narrow strand, covered with the detritus of the conglomerate, and with immense blocks.

In these remarkable strata pieces of the granite of Verkhnei Udinsk and Selenginsk are found, bound together with a hard siliceous cement, partly preserved entire, partly ground so fine as to lose every trace of original union. Fragments of feldspath porphyry are equally frequent in the mass, but they are always worn round and never broken so fine as the granite. In the blocks at Kadilnaya I saw also rounded pieces of milk white quartz, tinged with grey ore of manganese, which is so frequently found formed wherever there have been eruptions of porphyry.

Going further along the coast, as far as the Angarà, one sees at every rock proofs of violence, for strata, the joined surfaces of which indicate a once horizontal position, now stand vertically and like parallel walls. Sometimes they are split above, and then a crag, extending from the interior region, towers high over the coast. The lateral glens thus divide promontories, from which one cannot look down without giddiness; and the shores of the lake under the water are no less steep, for a depth of 700 feet has been found at the distance of only 900 feet from the bank. It can hardly be doubted that one and the same force raised the strata of the bank, and caused the subsidence of the ground on the site of Lake Baikal. It is, furthermore, interesting to observe the relation which this conglomerate of Baikal bears to the fine grained micaceous granite, which forms so considerable a portion of its mass. The latter must have already hardened, and have been afterwards often broken to pieces, before the cement of the conglomerate was formed, and rounded stones bound to-

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gether by it; and yet at Verkhnei Udinsk are to be seen great masses of this granite, forced in between the steeply inclined strata of the conglomerate. Consequently the crystalline rock, after existing a long time and at rest, must have been softened again, and forced into the fissures of the strata which covered it; and, moreover, this event was contemporaneous with the upheaving of the strata of the conglomerate and with the opening of the chasm, which is now filled with the waters of Lake Baikal.

We crossed over two cracks in the ice of the lake which were formed only last night. They were so wide that four horses in a tilega from Listvenishnaya fell into one of them this very morning, and were saved with the greatest difficulty. The same place had been travelled over the preceding evening, and found quite safe.

The place where the Angarà issues from Lake Baikal was to-day again quite free from ice. The water flowed with a murmur, and formed foaming waves; on which were rocking immense flights of wild ducks. They never quit this place, and endure the cold of winter here as well as on all the lakes of the arctic regions, which are kept open by springs. Near Listvenishnaya we saw the Baikal fleet in a wide basin on the left, or further side of the river. Several galliots were lying at anchor, completely masted; there were also some barges like merchant vessels, and on the shore stood a crane for unloading. The rocks on the right bank are in that place covered with wood; but they soon after reappear, and instead of the coarse conglomerate, we now see the fine-grained sandstone of the plain of Irkutsk, along with deposits of a black carbonaceous earth. These strata are at first much more gently inclined than those of the conglomerate at the Baikal, yet, like this, to the north-west. In the evening we reached Irkutsk,

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where the meeting again with former acquaintances compensated us for our separation from the Buraets and Chinese.

February 28 *to March* 18.—During my second residence in this remarkable capital, I was employed in observing the periodical variations of the magnetic declination. We completed, also, by collecting documents, and by oral information, our views respecting the geognostic relations of the Sabaikalian region, as well as the origin and manners of its inhabitants.

In the night of the 7th of March we had an earthquake, which shook all the country around. I was already awake, when suddenly, about forty minutes past four in the morning, the bed on which I lay began to vibrate rapidly and uninterruptedly. At the same time and same rate, I heard a loud clattering and rattling, like that of the interior of a mill. When the vibration and noise had lasted about ten seconds, there followed a still more violent shaking of the walls, and then, after five seconds, all at once a hollow report. The ground, at the same time, shook so violently, that for some instants I expected that our wooden house, which already leaned much to one side, would fall. There followed, however, only vibrations like those at the beginning; lasting the same time, and attended in like manner by rattling and rolling noises. Then all was quiet. I watched in vain for the repetition of this mysterious occurrence, which left nothing behind but amazement, and awakened curiosity.

The audible parts of the phenomenon might be compared to the rolling of thunder which has been once interrupted by a loud clap, and then continues regularly diminishing in force. It is possible that loose parts of the house contributed to the rushing noise at the beginning and end of the earthquake; and I thought I recognised the rattling of a lamp, which

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was suspended by metal chains before the holy image in my room. But certainly all the sounds heard cannot be explained in this way, for if the report like a clap of thunder had proceeded from any of the beams of the house, we should not have looked in vain the next morning for some traces of the mischief done. We found, however, all parts of the house uninjured, and the inclination of its foundations too, which was ascribed to preceding earthquakes, seemed to have undergone no change on this occasion.

The magnetic needle, with which I was observing the periodical variations of the declination, had, after the earthquake, exactly the same direction as before. I found it set in vibration by the shaking of the walls, but as soon as this was over, it exhibited the same course as at the corresponding hours the preceding and following days.

In about a week's time it was known that the earthquake had been felt the same night in Kiakhta, in lat. 50°·33, and also in Nijnei Udinsk, in 54°·90. At the latter place, which is encompassed, like Irkutsk, by the carboniferous sandstone, the stoves built in the houses were, in some instances, thrown down by the rocking of the ground. In Irkutsk, too, the phenomena seemed to differ in different parts of the town. In a stone building of two storeys, images fell from the nails with which they were fastened to the walls; and the inhabitants of this house described the accompanying rushing sound, as even louder than I had heard it. A soldier, who was keeping guard before the same house, being questioned immediately afterwards respecting the earthquake, declared that he had observed nothing of it; and yet a pile of logs, resting on the ground in another part of the town, was thrown down. Still more remarkable was the assertion made by one of the inhabitants of Irkutsk, "That he could foretel an earthquake." And in truth

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he did so in this case; for a few days before it took place, he desired me to secure all the more fragile instruments in my room, as, from the appearance of the weather, he inferred that an earthquake was not far off. It was, indeed, remarkable that in the first week of March we had frequently, with gentle east winds, a thin fog and starless nights. I saw twice, at sunset, clouds gathered in cumuli, under elevated cirri. The evening before the earthquake the sky was clear, but a thick mist formed in the night, which did not disperse till the following afternoon.

Two lighter shocks had been felt here in the summer and autumn of the same year, and the frequency of these visitations gives great weight to the opinion of the people of Irkutsk on the subject.

In reference to the rushing noise which accompanies the earthquake, and its connection with the condition of the atmosphere, I shall relate the following Russian accounts, as supplementary to my own observations:—On the 17th March, new style, 1819, between nine and ten o'clock in the evening, there began an earthquake in Kiakhta, with merely a hollow and rolling noise, which was especially described by the observer as a *subterranean* noise. A little after, came the clattering and creaking of doors and windows, accompanied by a violent rocking of the ground. This last phenomenon, however, was perceived only at the northern end of the town; at the southern end no rocking or vibration was felt, and yet the subterranean thunder was heard as plainly there as at other points.

Very similar circumstances have been observed in Kiakhta since we were there; on the 3d January, 1835 (new style), a smart shock was felt about 7h. 55m. in the evening, the weather at the time being moist and foggy. "The first thing observed was a hollow sound, interrupted by single claps like

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thunder, resembling, altogether, the sound of a distant storm. After that followed shocks, which lasted about five seconds, and ended with so violent a concussion that all the buildings tottered. The next forenoon, the vapours which had lain on the earth the whole night, rose over the neighbouring mountains, and covered the trees with hoar frost. Then it floated in the air, as great separated clouds, or *as rain clouds in summer.*" It appears to me significant that the rattling and the thundering sounds are perceived in these cases antecedent to the vibrations and shocks, so that the former cannot by any means be looked upon as the consequences of the latter. The phenomena compel us rather to admit that, in these cases, as in volcanic craters, detonations take place in the interior of the earth. The anomalous increase of aqueous vapour in the atmosphere at Kiakhta, has appeared, also, to the most recent observers, to be dependent on the subterranean movements.

Many other manifestations of volcanic agency are discoverable throughout the Sabaikalian region and in the northern half of the government of Irkutsk, in the composition of the rocks, and their position. In the plain along the Angarà, below Irkutsk, prevails the fine-grained sandstone of the carboniferous system. Strata of pure coal, nine feet thick, have been found in it. It extends northwards as far as Nijnei Udinsk, and to the south, insulated masses of the same formation are found far beyond Lake Baikal. I received from the steppes of Selenginsk, through the kindness of Mr. Yuill, specimens of black and shining stone-coal, with sulphureous pyrites disseminated through it. Similar specimens are found at the Chinese borders, on the banks of the lower Argoon (near the village of Gorbúnova), and those of the Onon borsa, which falls into the Onon. At the sources of the Vitim, also, in lat. 54° and long. 8° east of Irkutsk,

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are found trunks of trees, partly petrified with pyrites, and partly carbonised. Some of the salt springs in the government of Irkutsk take their rise in the unbroken central mass of this coal system; others, south of Lake Baikal, at the places above referred to, where separate portions of this formation make their appearance among other rocks.

Granitic chains, which have broken through these stratified rocks and fissures, through which volcanic masses have been thrown out to the surface, have, collectively, in this region, a north-east strike, parallel to the Baikal. On the Sayan mountains, which form the boundaries of the circle of Minusinsk towards China, as well as in the northern half of the government of Yenisei, the easterly strike prevails; and this is also the direction of the mountains which mark the southern limits of the circles of Nijnei Udinsk and Irkutsk. But from the highest point of the Sayan chain, run north-eastwards the chains of rocks, and the fissures which constitute the chief features of this region. Thus, at Nijnei Udinsk, we see the Uda accompanied by two parallel ranges of mountains, many miles asunder. Towards the valley they present steep precipices, and far off to the south-west may be seen the summit of Sayan, from which they proceed. The formation of this broad valley can no more be ascribed to the action of water than that of the Baikal itself; the environs of which are recalled to mind by the forms of the mountains round Nijnei Udinsk. In like manner, the valley of the Irkut is in reality a fissure, and towards its origin volcanic rocks have come to the very surface; while, lower down, towards Irkutsk, they show themselves only through the rugged fractures of the stratified rocks that cover them. I have seen many basaltic lavas which were found in the upper half of the valley of the Irkut, yet only upon its broad and level floor.

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The sides of the valley, which are there many miles asunder, consist, according to M. Hesse's observations, to the south of the river, of granite, and to the north of hornblend rocks. The origin of the volcanic masses, which are found interposed between these rocks, must be sought for, according to the same authority, in an elevated summit at the source of the Irkut; and it appears that this summit still bears the marks of extraordinary revolutions, which it may, perhaps, have undergone within time of history. The Barga-Buraets, or those of the old faith, regard it as the mysterious dwelling of the Begdse, or chief of the spirits to whom they pray; and they name it, on that account, Mon-dorgon-ola, which signifies the mountain inaccessible to mortals. This phenomenon of the strike of true volcanic rocks, parallel with the Baikal, is repeated south of the lake. The rocks in question begin in lat. 50°, and 2° west of Irkutsk, continue along the valley of the Jida, through the steppe west of the Selenga, and again show themselves at the source of the Uda, in lat. 52° and 6°·5 east of Irkutsk. At the bottom of the valleys of the Jida and the Uda, which, like that of the Irkut, are bounded by walls of granite, are found firm basaltic lavas with olivine. In the steppe of Selenginsk, on the other hand, prevail amygdaloids, the cavities of which are filled with chabasie, stilbite, and mesotype. The present continuance of volcanic agencies is indicated by the great quantities of carbonic acid disengaged in the springs of Pogromna, which issue in the upper valley of the Uda, on the limits of the granite and the basaltic lavas.

From these circumstances, one would be inclined to infer that the bed of Lake Baikal is a volcanic fissure or chasm, opened parallel with those already mentioned. The form and constitution of the mountains encircling it, all concur in favour of this view.

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The Khamàr group, the most northerly point of which we crossed between Verkhnei Udinsk and Polavina, is roughly broken towards the Daurian side of the lake; and on the opposite coast, between Kadilnaya and the Angarà at its outlet, the rocks show plainly that their strata have been continually heaved up by a force which has torn them asunder. Fossils, which are known, with certainty, in other parts of the earth to have their origin in volcanic clefts, are found in great perfection on the slope of the Khamàr towards the lake. From the rivulet of Slúidinka, which springs from this mountain, and about forty-six versts south-east of Kaltuk, or the most western point of the lake, are brought to Irkutsk crystals of prehnite and augite, and also the Baikalian lapis lazuli, which is nearly related to, or identical with, the crystals which are found in Germany in the crater of the Laachersee. It was hoped, in vain, that this mineral would be found in loco, in the granitic cliffs of the Slúidinka. It is still exclusively confined to the bed of the river near the lake; and there, volcanic masses, covered by granitic detritus, form alone the foundation of the valley.

I received, also, from the south-western bank of Lake Baikal, a sandy combination of glassy feldspath, with sphene and magnetic iron, where it had been thrown up by the waves from the centre of the basin. These are fossils which we find thus together in the Rhenish lavas, and in the blocks of gneiss of the same region, which have been changed by volcanic eruptions and sublimation. Finally, the hot mineral springs on the borders of the Baikal, prove that unusual communication still exists there, between the surface of the earth and its deeply situate strata. Along the coasts, on the side of Irkutsk, there are some of these, in lat. 54°·9 and 4° east of that city, near the little river of Kotelnikov, which flows into

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the Baikal. These are used for medicinal purposes by the Buraets alone, as they can be reached from Irkutsk only by a difficult bridle road. But the inhabitants of the Russian towns, on the other hand, flock every summer to the baths at the hot springs of Turkinsk, which rise on the Daurian side, in lat. 52°·8 and 4°·2 from Irkutsk. They have a temperature of from 45° to 50° R.; and M. Helm, with whose distinguished chemical labours I became acquainted in Yekaterinburg, has found them to contain carbonic acid, sulphuric acid and natron, with a small quantity of lime and magnesia. He thought that the bases above named were chiefly combined with the sulphuric acid. But it is likely that the ingredients of these springs enter into new combinations, when they have remained a little time in the atmosphere under diminished pressure; for at the wells of Turkinsk — and I have observed the same thing in the hot waters at the foot of the volcanoes of Kamchatka — a great quantity of sulphuretted hydrogen goes off while the water is cooling in the air; at the same time, many of its earthy constituents are deposited on the stones underneath.

In like manner as the Daurian coast of the Baikal is followed by the Khamàr mountain, so the Yàblonoi, or mountain of Nerchinsk, runs parallel with the strike of the Jida and Uda, on the south of them. It crosses the Chinese and Russian boundaries in lat. 49° and 5°·5 east of Irkutsk, and extends thence through Dauria, parallel with the Baikal, to lat. 49° and 13° east of Irkutsk. On the south-eastern slope of the northern half of this range, lies a moderately undulating tract, about 120 miles in width, bounded on the north by the longitudinal valley of the Shilka, and on the south by that of the Argoon, and which is traversed by rich veins of metal. These deposits are worked in the mines of Nerchinsk, through an extent

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of 160 miles, in the direction of the strike. The metal obtained from them annually, amounts in weight only to 76,000 poods, that is, to only a hundredth of the produce of the Uralian mines. It is, nevertheless, of great importance to Russia, because the metals contained in the lodes of Nerchinsk, are totally different from those of the Ural. The Nerchinsk mines yield annually about 35,500 poods of lead, of which there is scarcely any found in the Ural; they are equally distinguished by their richness in zinc and tin ores. The produce of the latter may be much increased, it is said, by the improvement of the works. Then, besides, there are annually sent about 390 poods of silver, 4 poods of gold, and 40,000 poods of iron, through Siberia to Europe from the mines of Nerchinsk. The produce of gold will necessarily increase, for it was discovered, as the result of some geognostical researches, begun in 1828, that a detritus, containing particles of gold, is to be found in the lateral valleys which run from the central ridge of the Yablonoi into the longitudinal valley of the Shilka.

The specimens of rocks and minerals, from the different points of the circle of Nerchinsk, which I obtained in Irkutsk, show very plainly that volcanic reactions have taken place in that region also; and sometimes very close to the metallic deposits. Granite, interspersed with greenstone, extends from the main ridge to the left bank of the Shilka. Metallic lodes have been nowhere opened in this quarter; but, on the other hand, attention has been here turned, of late years, to the greenstone detritus containing grains of gold as in the Ural. It is on the south side of the Shilka, between the valley of that river and the longitudinal valley of the Argoon, which runs parallel to the former, that what is properly called the mining district lies, divided into seven separate wards. The

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lodes stand partly in dolomite, which rests on clay-slate, and partly in the clayslate itself. The highest point of the granitic masses is at the sources of the river Gasimur, and rises about 700 feet above the surrounding plain; while the most elevated point of the Yàblonoi itself, at the sources of the Khilok and Ingoda, is found to be 1420 feet above the same plain.

Copper, which is found in the Ural in such enormous masses, is almost totally wanting in this district. In the most northern of the seven wards on the Shilka, is found a sky-blue malachite, with compact carbonate of lead disseminated through it; but these specimens, and those of red copper ore from other pits, are now regarded as rarities in the local collections; and the working of the copper ores has been abandoned for the last ninety years as unprofitable.

In the most northern of the wards, which is named from the river Shilka, the metallic deposits, lying in dolomite, strike to the north-east. Brown iron ore forms the matrix in which lie glance and carbonate of lead. The mines of the two middle wards, which are situate on the river Gasimur, are distinguished from the preceding by containing zinc in abundance. The four southern wards, on the left bank of the Argoon, seem to be still richer in combinations of volatile materials. Lastly, the most southern ward lies on the river Uryulungi, which flows into the Argoon. Its mines stand in talcose limestone and clayslate, which are penetrated by coarse-grained granite. Lead is their chief produce; but ores of arsenic and antimony are also found in them.

The above-mentioned primitive formation, which separates the ridge of the Yàblonoi from the metalliferous limestone district, is, further westwards, between the Ingoda and the Onon, distinguished by its tin ores, and other rare fossils. The parallelism of the

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lodes in the limestone formation with the chain of the Yàblonoi, and with the volcanic chasms in the Sabaikalian region, increases the likelihood of an original connection between these various phenomena. But this reasoning fails altogether with respect to the tin lodes in the circle of Nerchinsk: they strike to the north, quite independent of the north-eastern direction of the rocky system and its longitudinal valleys. It was in 1812 that the Russians first discovered this new source of riches. The Buraets of the steppe called Aginsk (of the Aga), a level and elevated tract, which lies between the left bank of the Onon, and its tributary, the Aga, were long acquainted with the art of extracting the tin, and used to make vessels of it for religious uses. In the year just mentioned, one of their Taïshes, or petty chiefs, pointed out a lode of tin to some Russian miners, and sold it to the Russian crown, in the name of his people. This first known mine of this metal, lies between the brooks Tsugol and Sotsul, which enter the Onon on its left bank, in the middle of the Aginsk steppe. The rocks found there are clayslate and gneiss, the former resting on the latter; and veins of quartz penetrating these rocks, and which, containing the tin ores, strike northwards. Since that time the Russians have discovered, in the same district, many more, and very similar tin mines; among others, one on the right bank of the Onon, near the village of Nijnei Sharanai. There in the micaceous schist, stand narrow masses of granite, which project, as a ridge, striking northwards, above the surrounding strata. The mica of this granite resembles silver; and the tin ore accompanying it, is always crystallised, and attended by foliated wolfram and garnets.

It is evident that the emerald and topaz mines of the circle of Nerchinsk are connected with these tin lodes. They are situate at a point which lies very

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close to the line of the tin mines, continued southwards from Sharanai, on the Onon borsa, where this river discharges itself into the Onon. The ridge of hills at that place is called by the Russians and Buraets Odon-chelòn; and the emerald mountain, in the ridge, is called by the Tunguzes, Tut-Khaltui. The splendid cells of mountain crystals, with green, yellow, and blue emeralds, and with topazes, are found along with tin ores: they seem to be the quietly crystallised portions of a great lode, which forms the entire mass of this mountain.

It now remains for me to communicate some ethnographical information which I received from M. Igumnov and M. Kavalevski, so far as it relates to the questions suggested by my intercourse with the Buraets, and by witnessing their religious ceremonies. M. Igumnov presented me with a copy of his translation of the Greek Catechism into the Buraet language. It was printed from sixty-five lithographed plates, and forms a book of the like number of pages, in the peculiar longish form which the Buddhists are used to, each page containing eighteen lines, about three inches long, and running downwards. The words follow one another from top to bottom, and the lines from left to right. In this, as in many other cases, the translator found himself between equally dangerous rocks, since he had often reason to fear that he might become obscure by introducing new words, or be misunderstood if he retained old words to which certain religious ideas were already attached. M. Igumnov has somewhat changed the orthography of several Christian proper names, in order to make it easy for the Buraets to pronounce them; hence, Christus has become Kirissetos. The Greek words which occur in our translation of the Bible, are here only partially retained; yet, in the title of the book, we have ketikisis for catechetical; but *amen* is rendered,

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in Buraetian, at full length, by " be it so done;" and in the concluding lines, which have been added to the Catechism by the translator, he has expressed some Christian ideas, in language which Buddhists might use under the same circumstances. He says —

" In the presence of the high-lama Michail, I have carefully translated, in 1823, this most important elementary book. May the pure faith in the Most High, the God of Gods, the Triple-formed, and yet only one great Burkhan, continually spreading wider, redeem and save mankind."

Here we find the title of the Buraetian priesthood given to a Russian Archimandrite, and even the Deity named in the manner the most accommodating to the Buraetian religion.

The annexation, however, of a new religious language to that already in common use, has occurred before now, and not very long ago, to the Buraets, and the kindred Mongolian tribes. They were all attached, in earlier times, to the religion which the Russians call Shamanism, and to which a large proportion of the Buraets in the government of Irkutsk still adhere. Their conversion to the Tibetan creed and worship, may possibly have been attempted at an earlier period; but it was not completely effected in these steppes till the middle of the eighteenth century.

It was then that the Siberian and Chinese Mongols first received the Ganjur, that is, the Tibetan code of religion, which consists of 108 parts, each of which is said to contain 1000 folio pages. The compilation of this work is ascribed to a man named Aiji-taindalam, of the Mongolian tribe of the Eolets, who undertook for that purpose a journey from Songaria to Tibet.

The Buddhist priests or lamas, who came to convert the Buraets and other Mongols, and who settled

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among them, explain in the following manner the sacredness of their calling, or rather their direct derivation from the godhead. They call the eternal being "the three holy perfections," or, in Mongolian, "lama gurban erdeni;" and they symbolise this divine essence, or represent it to the senses, by three globes, surrounded by dazzling light. It is divisible into Nom, Lama, and Burkhan; that is to say, the doctrine, the priesthood, and the divinity: the last comprehending a great many classes of persons supposed to be more or less perfect. These were the subjects of the pictures which we saw in the Buddhist temple. Chigemune is one of them. He is a prophet of the true faith, who by his virtues attained divinity, or the state of pure mental abstraction. Since that time he reigns over that fifth part of the Buddhistic world which is inhabited by men, and takes pity on those souls, which, though debased by the union with the body, and by the contact with earthly things, might yet be saved, if they could only withdraw their attention from what is without, and fix it within themselves. But as it is not assumed that the highest and purest spirits ever interfere directly with earthly affairs, Chigemune cannot save mankind in his proper person, but only by an emanation of his essence; and it is this fundamental article of the Buddhistic doctrine, which the lamas symbolise by the pouring out of the holy water.

According to the Mongolian tradition, the Lord of our world allows a portion of his spirit to pass into his first minister, or the principal earthly Burkhan, and the latter to appear in India, among a people whom the Buraets call Yenet-kek. This original head of the priesthood is named Banchan Yerdeni, or Banchan Bogdo, and by means of metempsychosis he is endowed with an everlasting and uninterrupted existence. The Banchan stands so far on an equal

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footing with the Dalai lama in Tibet, that they reciprocally select each others' successors; for on the death of the Indian priest, the child into whom his soul has passed is recognised by the Tibetan priest, and on the death of the Dalai lama a similar office is performed by the Indian priest. Between the Dalai lama and the Khamba lama, the Mongols acknowledge another dignitary, holding a very important step in their hierarchy. This is the Kutukhta, who resides always in the Chinese city of Urga, among the Kalkhas Mongols. As the Chinese viceroy, with whom the chief authorities in Irkutsk have to treat in all matters relating to the boundaries, resides also in the same place, many of the Russians have seen that remarkable personage; among others, M. Kavalevski, who, a little before our arrival, was one of a party who carried a letter to the Van, in Urga.

The present Kutukhta was brought, in 1781, from Tibet to Urga, when he was as yet only eight years old. On the journey he encountered the Emperor of China, who happened to be at that time engaged in the *Murana Aba*, or great yearly hunt. It was in Urga that the youthful saint first learned to read and write Mongolian, and for many years he conversed with his subordinates through an interpreter; but in the mean time, nevertheless, he was worshipped by them as if he were divine. None but the chief people among the Mongols may presume to touch the steps of his throne, and only with the forehead; as to the multitude, they are forbidden even to look at the Kutukhta. They are obliged to keep their eyes fixed upon the ground when he is carried by in a covered litter; they lay themselves then on the ground, in such a way that the bearers of the saint must tread them under foot, for this is the closest and most sanctifying of the mutual relations which can subsist between them and the Kutukhta. There is,

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in Urga, a temple of the same form as that of the Khamba lama, but built of stone, and so large that it can hold 12,000 lamas. There are lying in that church, among other things, in silver gilt coffins, three corpses, in which the soul of the Kutukhta dwelt before it chose its present resting place. This priest also wears, when he is on his throne, a high conical mitre of bright yellow stuff, and robe of the same colour, which leaves his right arm uncovered.

As to the other priests, it is not taken for granted that their souls pass so decidedly into the bodies of their successors. This certain transmission of the archieratical spirit, is confined to the Bancha, the Dalai lama, the Kutukhta, and the Khamba lama.

The lamas of inferior rank obtain the reputation of sanctity rather through learning, pious vows, and penances; the general object of which latter is, to release the soul from its corporal tenement, partly by means which lead, in fact, directly to this end, partly by superstitious arts, which impose on the vulgar. They are divided into the *Khuaraki*, or monks; and *Obushi*, or secular lamas. Every Mongol who has more than three sons must devote one of them to the monastic life, and he can then rise, in succession, to three ranks or gradations of the priesthood, called re-respectively, banda, guitsul, and guilan. Each of these degrees is attained by the performance of ascetic vows, and for the highest of them, or the guilan, there are not fewer than 253 strict injunctions, among which is that of poverty. Consequently this highest rank, which confers a sort of canonisation during life, is attained but by few of the lamas, and by these only at an advanced age. The degree of obushi is conferred much more easily, and even on married Mongols living in their own yurts. The obushi, however, must not shed the blood of any animals, they are bound to observe certain fasts, to pray regularly, and

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they wear a red girdle as a mark of their spiritual standing.

In like manner, the Mongolian women can belong to the spiritual body in two ways: if they enter a convent, they are called Chibagantsi; if they stay in their own yurts, and only perform vows, they are Obusuntsi. The former of these are bound, among other things, to shave the head, and then, like the lamas, they wear scarlet clothing; while the Obusuntsi are distinguished from other women only by wearing a red sash over the shoulders. The handsome clothes of blue silk, and the head-dresses of jewels which we saw on all the Buraet women at the divine service in the temple, are no marks of religious rank; but it is possible that they were worn by the desire of the lamas, for, according to the Buddhist faith, it is meritorious for a priest to be in the neighbourhood of handsome and well-dressed women, and to sink in the passionate contemplation of them to the wished-for unconsciousness.

Such is the way in which the numerous and curiously organised army of Buddhist priests subsists among the Mongols. They tell the people that they shall be removed after death to the happy state of perfect abstractedness and of serene thought, never interrupted by the contact of matter or impressions of sense. The transition to this state is to take place by means of a number of regenerations, yet it may be hastened by religious observances on earth. Along with these purer doctrines, the lamas conveyed to the Buraets that chaos of legends also, and magical ceremonies with which we have become acquainted from Tibet itself, through the Capuchins, who lived among the Buddhists, a century or two ago, at Lassa, on the Burrampooter; and owing to those very parts of their religion that were addressed to the senses, they were better able than the Christian priests to gain

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over the pagan or Barga Buraets, who believed in numerous conjurings and magic rites like those of the Buddhists.*

The Buraetian families, who subsist by the chase, and whose homes are in the more inaccessible districts, and, indeed, most of the Tunguzes of Irkutsk, have still kept quite aloof from the religion of Chigemùne. Among them is still found their original religion of nature. They, too, have their priests, or rather their soothsayers and conjurers, who are called in Buraetian, *bugoi* or *udagan*, according as the sacred office is filled by men or women. Among the Tunguzes they are called Shamanui, as well as by the Ostyaks and many of the Tatar tribes. The Bugoi of the Buraets of the old religion, maintain that they know better than other people how to deal with certain mischievous spirits, named by them *Ongotui*. At the head of these is a spirit named Begdse, which dwells on the Mondorgon-ola, or the volcanic mountain near the Irkut, already mentioned. The promontory at the place where the Angarà issues from Lake Baikal, and the island of Olkhon, are also sacred places, where sacrifices are made to conciliate these spirits, and, as proof of their acceptance, are carried off secretly by the Bugoi. The Buraets have been accustomed, from the oldest times, to celebrate yearly festivals for the good spirits. Naked mountain tops are selected for that purpose, and the spots so chosen

* See the collection of missionary information in "A. Georgii eremitæ Augustiniani alphabetum Tibetanum, præmissa dissertatione de gentis origine, moribus, superstitione," &c., Roma, 1762. The opinion of this missionary that Buddhism originated in the errors of the Manichæans, and is therefore but an imitation of Christianity, offers, indeed, an explanation of the resemblance between the two rituals; but it has little foundation, and cannot be reconciled with the statement of the Tibetans that they received their religion from India Besides, the Christian religion contains no germ of the doctrine which characterises essentially the religions of India and Tibet; namely, that the soul is to be purified and saved only by abstract thought, or undivided contemplation.

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are marked by an *obo*, as it is called, or rude heap of stones. About Midsummer, when the cattle of the steppes are in the best condition, offerings are brought to these altars, and the solemn rites are followed by wrestling matches and other popular amusements.

The Buddhistic lamas have recognised and sanctioned all those ancient usages, in order that the Buraets may regard the new religion only as an extension or completing of the old. They have declared the Begdse to be a true Burkhan, and in honour of him they allow their followers to celebrate a great popular festival every three years, near the temple of the Kutukhta at Urga, on the mountain of Khan-ola. With their chiefs presiding, the Kalkhas Mongols, who are Buddhists, there contend in wrestling, racing, and archery, and the victors in these games receive names of honour and other rewards. The making of a census, and consultations in public affairs are associated with this festival. The lamas emulate likewise the medical skill of the conjurers of the old creed. M. Igumnov related to me, among other things, that they disperse gouty swellings by beating them often and continually with little rods.

In conclusion I must remark, that there is hardly any other place which offers such opportunities of acquiring the Mongolian and Buddhistic learning as the government of Irkutsk. Here the Buraetian language may be learned from almost any of the Russian Kosaks, who speak it for the most part as fluently as their mother tongue. This preliminary acquirement may be completed in Selenginsk by intercourse with the lamas, and may be turned to account by collecting books, which are to be obtained from those priests for very slender services. At the sight of the enormous heaps of books in the temple of the Khamba lama, one might be diposed to think that the possession of any one of them singly would be of little

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consequence, and yet in many of the great public libraries of Europe there is still not a copy of them to be found. M. Yuill procured for us from the priests, with whom he was acquainted, several Buddhistic works, of which I shall describe one more minutely. It consists of fifty-four leaves of thick writing paper, which, as the watermark shows, reached the steppe from a Russian manufactory. The wooden blocks with which it was printed were, as usual, of a very long form; for every page, containing eighteen vertical lines, is surrounded by a margin of only three inches in height, with nine inches in length, so that it has on an average fifteen characters in each line, and 270 in each page. The whole is printed in black, but it is thickly painted in a few places with red and yellow ochres, and the leaves are numbered, not with Mongolian but with Chinese figures. As to the contents of the book, M. Schott's researches furnish the following explanation.

The religious works of the Buddhistic priesthood are divided into two great classes, and entitled, respectively, Sudur and Shastra. Works of the first kind are either purely didactic or mixed with history, and are venerated as containing the word of Buddha; and the great religious code, named the Ganjur, is nothing more than a complete collection of these Sudurs. The Shastra, on the other hand, like the Apocrypha of our Bible or the Roman Catholic legends, are edifying stories, full of wonders, and calculated more for the common people. The work under consideration belongs to the first class, or to the Sudurs, and to that sort of them which is designated by the Mongolian expression *yeke külgen*, or "the highest means." By this we are to understand some religious means of liberating the spirit, and the Sudurs bearing this title, show how the highly gifted follower of Buddha may gradually disengage himself from all

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that concerns sensation, in order to arrive, through ten paramita or passages, at the blessed abstractedness of Nirwanna. These yeke külgen sudur are, consequently, the most valued of all. The title of this book, at full length, was, "The sudur of the great means, called the diamond sudur, whereby one may reach the further shore." By the further shore we must understand the secure haven of abstract meditation, which is reached across the sea of transmigration.

The same work is translated into Chinese, under the title of kin-kang-king, that is, the diamond canon; and, moreover, this translation was made directly from the Indian original, but the Mongolian indirectly from the Tibetan. In my copy of this sudur there is on the back of the first leaf, witten in red ink, an invocation of the Buddhistic trinity—divinity, doctrine, and spiritual ministration; then follows, as is usual in all the sudurs, the title of the work in Sanscrit, Tibetan, and Mongolian, all written, however, in Mongolian characters. The book itself begins with an introduction, which is, substantially, as follows: —

"Adoration be to all Burkhans and Bodhisatvas!* Thus have I heard: once on a time, the most holy, perfect Buddha was staying at Shiravasti, in the flower-gardens of the king's son Chità, in the midst of 1250 of his spiritual adorers. When the hour of meals was come, Buddha drew on his priest's cloak; took up the begging bowl, and went into the great city of Shiravasti to beg for the food bestowed by charity. When this was done he returned, laid by his cloak, and sat down upon the ground. His fol-

* The Mongolian Burkhan is identical with the Indian Buddha, whereas a Bodhisatva, or associate of Buddha, is a being of high order, who has not, however, yet attained to the absolute dignity of Buddha.

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lowers, worshipping him three times, gathered round him, and then sat down by him. After a time the aged Subudi arose from his seat, bent his left knee, joined together his hands, and said 'Buddha, true manifestation, &c. &c., which is the highest means, and how can it be attained?'" Then follows a connected exposition of doctrine on the part of Buddha, which is interrupted here and there only by the short replies of his disciple Subudi.

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CHAP. XIII.

PREPARATIONS FOR DEPARTURE. — PROVISIONS. — DIFFICULTIES ARISING FROM WANT OF SNOW. — KHUMUTOVSK. — OLSONSK. — HUSBANDRY OF THE BURAETS.—MANSURSK.—THE LENA.—ROCKS. — GOITRES. — BOTOVSK. — SOKNINSK. — INCREASED FREQUENCY OF GOITRE.—SALT SPRINGS.—THE WOOD SPRITE.—USTKUTSK.— KIRENSK. — PREDOMINANCE OF THE TUNGUZES. — ICHORA. — DOBROVA. — CAUSES OF GOITRE AND CRETINISM. — CHARACTER OF THE VALLEY OF THE LENA. — GAME. — PARSHINSK.

In the second week of March, the thermometer in Irkutsk sank during the night to —10° R., but at noon the hoar frost always thawed from the roofs. I saw, for the first time with horror, the spring approaching, for it compelled me to depart, and yet I had many a difficulty to obviate or provide for before I started. I sold the sledge which I had used hitherto, and got a larger one of the same kind, which seemed by rare luck to have been destined for foreigners and outlandish purposes; for, instead of the magnetic instruments which it was now to bear, it had previously carried, from Tobolsk to Irkutsk, the properties of the Italian rope dancers above mentioned.

The Kosak, Alexei Mitléyev, who had lived with me in Irkutsk, and given me the requisite assistance in the astronomical observations, was now appointed to attend me to Yakutsk, and there, as is the ordinary course, to be relieved by another Kosak. I wished, however, to keep this old acquaintance with me as long as possible; and as Mitléyev willingly concurred in that arrangement, he received from the governor-general written leave to accompany me to Okhotsk or Kamchatka, and to obtain from the autho-

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rities there the means of returning. Besides the Russian, he understood also the Buraetian language, was very tall, dark complexioned, and, with a somewhat Mongolian look. He possessed in the highest degree the aptitude and cleverness of the genuine Siberian, but was close and taciturn, and gave utterance only, at odd times, to a fanatical love of Russian manners and religion, and horror of all foreigners.

We provided well in Irkutsk for our subsistence on the road. I bought tea and sugar in the Gostinui dvor for the whole time likely to be spent in the journey; forty pounds of Moscow tobacco for my own use, and bread and fish for our common need as far as Yakutsk. The latter were omuls from Lake Baikal, and muksums from the Lena. The salmon of the former kind, which are taken to the number of ten millions annually at the mouth of the Selenga, I bought partly in the dry state, partly in that peculiar fresh state in which the Siberians, with the help of the frost and a weak pickle, are able to preserve their fish. Some smoked hams, which I also took with me from Irkutsk, were concealed during the fast so as not to disquiet the conscience of my attendant, and so reached Kamchatka, where they were welcome rarities.

As to the physical observations, I resolved on following the same course as on my journey down the Obi; that is to say, that a halt should be made every morning to observe the magnetic dip and intensity, and, should the weather permit, to determine the geographical position also by altitudes of the sun. A second halt at the places where we were to stop for the night, was to serve, as before, for determining the declination, and for making observations of the stars. I also made an arrangement for corresponding readings of the barometer with Lieut. Due, who had decided on travelling, in a few days, down the Lena to

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Yakutsk, and then to return to this place. Both plans were duly executed.

March 19.—I left Irkutsk about two o'clock in the afternoon, with bright sunshine and a rapid thaw. We did not find a good sledge road till we were eight versts from the city, where we crossed a rather steep height, covered with trees on both sides of the road. Then we went again over level arable land, and after a few versts began to ascend the southern slope of a ridge, from which all the snow had completely disappeared. Here our horses refused their work, although we did our best to lighten the sledges. Nearly two hours passed away in vain efforts, till at last we obtained the assistance of some Buraets. They met us with a number of sledges, on which they were carrying hay to Irkutsk. They were travelling with oxen, of which they let us have a team to help us to the top of the ridge. On the slope red sandstone was visible.

It was about eight in the evening when we reached the station of Khumutovsk, which is only twenty-three versts from the city; and, according to the barometer, about 330 feet lower than the summit of the last ridge crossed over. The post-master at Khumutovsk had served as subordinate officer in the old Kamchatkan regiment; and he related many anecdotes of his residence in Nijnei Koluimsk, Okhotsk, and Kamchatka.

We set off in the evening, and travelled during the night, with bright moonlight, forty-five versts to Ustardinsk; we found ourselves always on the declivity of a tract rising to our right, and which separates this region from the Baikal. The cold was very piercing at midnight; the thermometer sank to —20° R., so that my fears on account of the approach of the spring were at an end.

March 20. — From five in the morning till eight in

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the evening, we went over 115 versts, through a mountainous district, between Ustardinsk and Mansursk. I made magnetic observations at Olsonsk, thirty versts from Ustardinsk. This place is situate on the elevated and humid tract which sends tributary streams at once to the Angarà and the Lena. I found it to be 435 feet above Irkutsk. We went, at first, over a high ridge, and then reached the stages Bagendaisk and Khogotsk, along the bottom of a broad valley, in the middle of which there is said to be a stream called Kámennaya riechka. It is bounded by two gently sloped ranges of hills striking to the north-east. We continued on the more northern of them, and nearly in the same elevation as Olsonsk; in Bagendaisk we were 522, in Khogotsk 370 feet above Irkutsk. This treeless country has now in winter a dreary and monotonous aspect. The road was marked by pointed heaps of earth, in the middle of each of which was fixed a post. We often saw the yurts of Buraets on the side of the way. They are huts, sometimes with four, sometimes six sides, formed with thin timbers, and flat roofed. The walls are covered on the outside, and the roofs are heaped up thick, with boughs of trees and earth.

The Buraets, in this quarter, have lived in fixed habitations of this kind from time immemorial. They possess large herds of cattle; but for their food they use mare's milk. They make hay in the valleys, and hunt the fur animals for their own use, and for trade also; for we met them frequently on the road, with sledges drawn by oxen, on which they were carrying their hay to Irkutsk. The men carried bows, which were much smaller than those of the Ostyaks, yet may possibly be quite as effective; for instead of the hard wood in the middle, the bows here were lined with handsomely polished plates of cow's horn. The glutton is very frequently killed in this neighbourhood;

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and among other specimens of valuable furs, I saw with the Buraets here, for the first time, the Burundùk, or striped squirrel. It is smaller and thinner than the European species, and is marked over the whole body with black stripes on a fawn-coloured ground. Its short, smooth hair, makes it more like the ermine than the squirrel, from which, nevertheless, in habits and conformation, it is not to be distinguished. There is some agriculture carried on even here, near the dwellings of Russians; yet much less than in the plain near Irkutsk, which we passed through yesterday.

A little before we reached Mansursk, we crossed over the somewhat flat chain of hills, on the south-eastern declivity of which we had been hitherto travelling, and came to a marshy spot covered with reeds, from which a stream flows north-eastwards to the Lena. Mansursk lies on this little river. It is a small Russian village, with ancient-looking houses. The meadows round the place were thickly studded with hay-ricks. Here I made an observation of declination; but, about eight o'clock, fog and thick clouds put an end to my labours. The temperature of the air was again down to —17° R., and the heat in the house where we took tea was extremely reviving. The people asked respecting the objects of my journey; and, when informed, an old Russian woman bid me "present her compliments to one Ivan Evséyevich, who, six years before, had set out on a journey from Mansursk to the Island of Malashka, which lies somewhere beyond Kamchatka." It is manifest that Unalashka was here meant. She then went on to tell me that even in Kamchatka the people live well, and in the greatest abundance; but beyond that, is a country where the houses are roofed with gold, and Malashka, she believed, was in that country. Thus we find European fables, of the time of

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the discovery of America, still living here, and still making reference to the north-west coast.

We started in the evening, and during the night went fifty-five versts, close to the great water into which falls the river of Mansursk, and arrived,

March 21, about four o'clock in the morning, at the village of Káchuga, on the right bank of the Lena. This river here unites the left branch already seen, with another coming from the mountains on the Baikal. Here we entered, for the first time on this journey, a true valley, and a region quite distinct from those already visited. At Káchuga the river, which is still of moderate size, is hemmed in by perpendicular rocks of fine-grained red sandstone, in perfectly horizontal strata, as if by artificial walls, above which the green pine forests rise forth very beautifully. The surface of the river is here 1500 feet above the sea.

As far as Verkholensk, thirty versts from Káchuga, we went again through lateral glens, from the valley to the wooded bank above; but afterwards we continued on the ice of the Lena. The stations — and by ten o'clock at night we had passed through Tiumenovsk, Korkinsk, Petrovsk, and Panamárovsk — are here inhabited exclusively by Russians, and are from twenty to thirty versts asunder. They consist in general of six or eight very old-fashioned wooden houses, and lie sometimes at the mouths of brooks in the openings of the valley, and at times close under the cliffs. The rock seen everywhere on the road to-day, was the dark red, uniform, and thin-splitting sandstone of Káchuga; and on the left side of the valley it showed itself in bare rocks with perpendicular sides, while on the right we often met with hills covered with earth and thick woods. The cause of this difference does not lie, as appearances might suggest, in any inclination of the strata; for the va-

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rious sections of them here exposed to view, throughout a great extent, and in many different directions, show them to be perfectly parallel with the surface of the ice. This makes some places below Verkholensk more remarkable, where the rocky strata, several feet thick, have a serpentine bending, and at their borders are crushed into union with other strata at acute angles. Blocks of sandstone are also found there, which look exactly as if their mass was in a state of undulation at the moment when it was rendered solid. The surfaces of every two strata are covered with perfectly uniform wave-like impressions, two or three inches broad, and of corresponding depth.

The sides and declivities of numerous islands in the middle of the river, consist also of naked rock; the islands are covered above, however, with groves of tall pines. The valley of the Lena seemed, generally speaking, to be exceedingly fertile; for there arose, in the most varied profusion, woods of larches, firs, pines, and Siberian cedars, wherever a soft soil had collected.

In the village of Petrovsk, eighty-six versts from Káchuga, I remarked, for the first time, large and developed goitres on several women of the place; and learned, with surprise, that this malady, which in Europe characterises the valleys of the Alps, is here frequent in the Lena. There was another circumstance which continually attracted notice during to-day's journey. The ice, in fact, on which we were travelling, shut in between walls of rock, seemed to me to be inclined downwards in the direction of our course. Our driver told me that he saw the same thing, but that it was quite natural, as we were now going down to the lower part of the river. But, according to our observations, the fall of the Lena, which between Káchuga and Tiumenovsk, like that of a

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mountain stream, had amounted to $\frac{1}{509}$, had diminished here, at Petrovsk, to $\frac{1}{4470}$. It is impossible that a decline so gradual as this could strike the eye, if it were not sensibly increased by optical circumstances. I am, therefore, disposed to think that this phenomenon was connected with the glistening and distortion of distant objects, which I remarked not only in this part of the valley, but frequently also on the following days. This proved that the air was ascending from the ice, and, therefore, that the lower strata were lighter than those above, in which the eye was placed; and, under such circumstances, a plane perfectly horizontal and level in fact, would appear depressed towards the horizon, or, in other words, it would seem to slope downwards.*

About midnight we reached Sigalovsk, 129 versts from Káchuga, and thence proceeded, without once leaving the ice of the Lena, till, at four in the morning, March 22, we reached Ustilginsk; and then again, during the day, in the same manner, till ten at night, when we arrived at Orlinsk, 144 versts from Ustilginsk. The cliffs of the valley were still formed by the red sandstone, with all the peculiarities already described. Here meadows extended over a broad

* If we suppose the eye of the observer to be ten feet above the ground, and the air at that level to be 10° R. colder than where it is in contact with the ground, a horizontal surface assumes in this case a hyperbolical curvature, the asymptote of which, passing through the eye, has an inclination to the horizon of $\frac{1}{187}$. When the difference of the temperature is 20°, the inclination increases to $\frac{1}{140}$. No change takes place in the apparent distance of the object, but only in its direction. The strong glistening, and the movement of the air upwards, which I observed in the neighbourhood of Obdorsk, prove, as well as the anomalous refractions on the Icy Sea, that such differences of temperature may occur even in very cold weather. This alone can explain a phenomenon observed by M. Stepanov on a journey to Minusinsk, in the government of Yeniseisk. It appeared to him as if the ground before him, and that behind him also, over which he had just passed, sloped towards him; this appearance lasted some time, and was, therefore, obviously but an optical deception.

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level between the Lena and the rocks, and we saw upon them the hay carefully made up, and some arable ground also near the villages. In Botovsk, forty-nine versts from Ustilginsk, I staid from nine in the morning till noon, to take the sun's altitude. The Russian inhabitants here, fish with what are called mordi; that is, with baskets of the same shape as those which I had seen on the Obi (see Vol. I. p. 444.), but not above three feet long. They treated us with fresh-caught nalùim, and cheered us good-naturedly with the hope that we should get larger fish, and of a better kind, at Kirensk.

In Golovsk I found the driver's house extremely well put together, and of a newer appearance than the other huts. When I inquired who was the author of this improvement, an exile settled in the place was named to me, who worked here, as is the custom, with the general aid and for the general good. Again I saw a great many cases of goitre among the inhabitants of Botovsk, Golovsk, and the following stages. But if we look for some peculiarity of climate distinguishing this region from the rest of Siberia, in which I never saw a trace of this disease, every one must be struck with the fact that the strata of air are here checked and confined between steep and parallel walls. The effect of this on temperature and humidity is so strongly marked, that we passed, on several occasions, with the most abrupt transition, from perfectly fine weather to heavy snow storms, as soon as the cliffs of the valley took a north-western direction.

March 23.—We arrived, about five in the morning, in Sokninsk, thirty-five versts from Orlinsk. The temperature of the air had been, at ten at night, —16° R., but with a clear sky it had fallen to —24°·3 R., a considerable degree of cold for the beginning of the astronomical spring. I was glad to warm myself in a house in Sokninsk, on the drying flat over

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the stove; where, with the mode of construction prevailing here, one may enjoy a real smoke bath instead of the ordinary vapour bath. The stoves used here are what are commonly called chernuiya isbui, or black stoves. In these, the great oven, built of masonry, serves both for cooking the meals and warming the house. It has the same form as in modern Russian houses, but with no chimney whatever, so that all the smoke, which, notwithstanding the breadth and depth of the fireplace, remains unconsumed, escapes into the room, along with the hot air, through the warming doors. It goes along the drying flat, which it soon blackens completely, and at last makes its exit through an only window, which is placed at the same level on the side next the door.

The Russians here undertake, every year, distant expeditions into the woods, in pursuit of fur animals; and just now a great many men were, on that account, absent from Sokninsk. We first heard here, too, of the Tunguzes, who frequent, for the same purpose, both banks of the Lena; but in Sokninsk it was stated that they rarely come near the Russian settlements on the river.

In the next village, Boyárskoe, where I made magnetic observations, the Russians seemed to be better acquainted with their Tunguzian neighbours. They told me that the latter came here not unfrequently to buy flour, and that they paid for it at the rate of three squirrel skins the pood. In Irkutsk these skins would be worth about 90 kopeks, and the flour 55; so that, according to these data, and the cost of carriage being taken into consideration, the traffic here is conducted equitably. The Tunguzes, in the country round the Lena, however, are under no necessity of procuring food from the Russians; for they eat besides, not only the flesh of the rein-deer, but of all the other animals which they kill for the fur trade. I

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was told, also, that they come to this place mounted on rein-deer, a single piece of voilok serving them for a saddle; and also that they hunt with gunpowder and rifles, which they procure for furs in summer, from the merchants going down the Lena.

I found the character of the valley, and of its steep, rocky boundary, just as it was yesterday. The hills seemed to abound in little streams. I frequently saw icebergs, which had arisen from springs formed against the lower strata of the sandstone. In these cases the passage of the waters to the Lena, could only be effected under the frozen mass.

In the villages of Rijnaya and Turutskaya (sixty and ninety-four versts, respectively, from Sokninsk), goitres were still more frequent than hitherto. I saw them to-day on several men also; in the valley higher up, the disease seemed to be confined almost exclusively to women. The sufferers here had also a bluish complexion, with projecting eyes and a staring imbecile look. In Turutsk I asked an exile, who was the only healthy looking inhabitant of the place, how he had protected himself from goitre; and received for answer, that adults arriving from Europe were never attacked by the disease; that "the goitre was born with the children of the natives, and grew up with the man."

After a bright morning, a double stratum of cirri, and cumuli underneath, gathered about noon, but it dispersed again towards evening, and I obtained in the village of Ustkutsk a good observation of the stars for determining the declination and geographical position. We stayed for the night in Ustkutsk, as I wished to see the salt springs which are found near this place. The public room where we had taken up our quarters on the benches, was enlivened, as usual, till a late hour at night, by talkative carriers

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and others of the inhabitants, whom curiosity brought to see us.

March 24. — One of the peasants took me in the morning, in his single-horse sledge, to the salt springs; they lie about four versts west of Ustkutsk, in the lateral valley of the river Kuta, which itself falls into the Lena. On the left bank, along which we went, I found dark-red, extremely fine-grained sandstone, until we arrived at a place where these hills retire a little from the river, and enclose a plain which lies but a little higher than the bed of the valley. The surrounding heights are covered with pine wood, but the plain itself is bare, with marshy ground, from which project blocks of porous and worn limestone. The brine springs which are found in the vicinity of this rock, discharge themselves partly into a salt-pond about thirty feet in diameter, and five feet deep. Some of them would flow off under the marsh into the Kuta, if their water was not collected in a well, dug and secured with timber-work. I found the water in this well extremely salt to the taste; it was at the same time perfectly free from ice, although, even at the bottom of the well, to which I let down a thermometer in a bucket loaded with stones, it had a temperature of only — 4° R. The boiling-houses and salt-pans, in wooden buildings near this basin, are used only from March to September; and 20,000 poods of salt, to supply the circle of Kirensk, are said to be procured in that time. The management and working of these springs, and the adjoining woods, are now given up to a merchant of Kirensk. He receives from the treasury 23 kopeks, or nearly 2*s.* for every pood of salt which he delivers to the public stores; and a contribution also of 2700 roobles to the cost of the works, as well as 30 convicts as labourers, to each of whom he has to pay 50 roobles

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yearly. These live in Ustkutsk, and may engage in other occupations during the winter.

On my return to the mouth of the Kuta, I saw, on the left bank of this river, several smaller springs gushing forth, which kept the ice open round about, and also tasted very salt. The saliferous strata lie there, also, beneath the red sandstone, which forms the walls of the valleys over the springs. Respecting the valley of the Kuta, my companion informed me, that it is inhabited for 100 versts up from its mouth by Russian hunters, but from thence to its sources, which he estimated to be 300 versts from the Lena, the country is wild and rocky, and is visited only by the wandering Tunguzes.

In Poduimakhinsk, forty-four versts from Ustkutsk, I remarked an old exile, who had his nostrils slit up. This mode of marking those who have been punished with the knout, is said to be now out of use, and, in truth, with the exception of the man just mentioned, I have seen it only in the case of some Russians at the southern point of Kamchatka, whither no convicts have been sent for a long time. The mark is a cruciform incision about a line wide, made at the lower edge of the nostril; and it appeared to me always to give the profile of the face a revolting, crafty look. The same class of offenders have also the word *vor*, *i. e.* thief, branded on the forehead; the *o* being in the middle, and the other two letters on the temples. These marks were not visible on the individuals whom I saw, because, perhaps, they had completely healed up, or were covered with the hair; but I believe that the nickname *vornak*, which is given at times to the convicts in Siberia, is derived from *vor* and *snak*, a mark; and is, consequently, a memorial of the more ancient and cruel criminal justice.

The next station, Kokuisk, consisted of only six

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houses, with twenty-two inhabitants; but it is distinguished for its picturesque position, close to the foot of a steep rock, which there encloses, on the left, the valley of the Lena. The cliff is nearly 400 feet high, and quite perpendicular at the top, but below, towards the valley, with gentler slopes, on which stand handsome larches and other trees of the same kind. The fallen blocks consisted, like those at the salt springs of Ustkutsk, of porous limestone. On the top of the rock the inhabitants of Kokuisk have erected a wooden cross, in order to lay, as they informed me, the *liesha*, or spirit that haunts the woods. The spirit, it seems, did as such spirits are wont to do. It threw down stones from the cliff on the people in the valley below, and did the same with the first cross set up to appease it. Cases of goitre were as numerous here as in the preceding villages.

Similar lofty and grand-looking cliffs continue to prevail along the road. In Sukhovsk, the next stage after Kokuisk, the inhabitants complained bitterly of the extreme poverty of the place. The valley is too narrow for agriculture, cattle cannot be kept owing to the beasts of prey, and so there remains nothing but the chase. Wolves and bears are found here in great numbers, and to destroy these the people coveted my Barabinsk dog, which was much stronger than their own dogs. They added, also, that even the Tunguzes in the surrounding forests were unable to procure the rarer and more valuable furs.

Notwithstanding the regular intercourse with Irkutsk, which is facilitated in summer by the navigation of the Lena, the settlements here seem quite cut off from the world. As a proof of this, the peasants of Sukhovsk, who, like all those on the Lena, are passionately fond of smoking, told me that they pay an entire rooble for every pound of the common, or what is called, Circassian leaf tobacco. But in Irkutsk this

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article sells for twenty kopeks; and, besides, it must be paid for here in squirrel skins, which the trader reckons at only two-thirds of their price in Irkutsk. In consequence of this, the people of Sukhovsk never smoke pure tobacco, but mix it with wood shavings.

About nine in the morning, the sky being clear, the temperature of the air in Ustkutsk was —18°·5 R. But when clouds gathered at noon, the thermometer rose rapidly to —4° R., and under the protection of the clouds the evening was little colder. In Sàrovsk, 113 versts from Ustkutsk, I found it, about ten o'clock, only —7° R.; yet the night air, owing to its greater humidity, felt extremely disagreeable, and confirmed me in my conclusion, drawn from previous experience, that it is easier to protect the body from the severest degree of dry cold than from mist.

March 28. — We arrived about nine o'clock in the morning at Potapovsk, seventy-three versts from Sàrovsk, where I made the usual magnetical observations. The elevated and uniform covering of clouds, and reduced degree of cold still continued; about four o'clock the west wind brought heavier, and lower clouds, on the increase of which every turning of the valley seemed to exercise a decided influence; and here, again, as on the 22d, we had partial snow storms in some windings of the valley, and fine weather in others.

From Potapovsk we went forty versts to Saborsk, on the ice of the Lena, as usual, and at the end of this journey had still, on both sides, very handsome walls of the red, fine-grained sandstone. The character of the country is exactly the same as at the beginning of the valley, only that the river is much broader, and the cliffs much higher. Between Sàborsk and Kirensk the Lena describes a circular curve, which is sixty versts long, and turned to the west. We shortened this way to twenty-eight versts, by leaving the

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ice, for the first time these four days, and crossing a steep mountain ridge, which there forms the right side of the valley. It rises, with two intermissions, to the height of 534 feet above the Lena, or 1315 feet above the sea, and is thickly covered with pine wood and poplar. From this height we again turned downwards, but not before we saw, a long way off in the east, other mountain ridges striking to the N. or N.W. From the nearest of them we were separated by the valley of the Kirenga, which enters the Lena at Kirensk.

The black houses of this city, and some churches lay before us as we emerged from the woods, which are scattered with picturesque wildness on the snow-clad hills, which separate the right bank of the Lena from the left of the Kirenga. We stopped, about seven o'clock in the evening, before one of the lowest of the wooden houses in the place, in which the public authorities had their quarters. There Mitléyev delivered our papers, and immediately afterwards one of the officers came to the door, to direct our driver to the residence assigned to us. This was in the house of an opulent burgher, which contained, above the rooms of ordinary use on the ground floor, an upper story, and a staircase in the interior leading to it. I found the chamber admirably heated, and extremely clean and commodious. It appeared sumptuous, in comparison with the lodgings which we had met with for the last seven days.

Towards evening the clouds vanished, and I observed transits of the stars, to determine the geographical position of Kirensk, and the magnetic declination. In a few hours, the air had again cooled down to —16° R.; and in the yard, where I set my instruments, the ground cracked with a loud report, from the rapid contraction which it underwent.

March 26. — The promises of the peasants in the

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upper valley of the Lena, were now fulfilled to perfection; for we were treated in Kirensk to-day with excellent stews of sturgeon, with caviar, and other fish-dainties, the salmon of the Lena being not the least delicious of them. Mitléyev would not relax in the least, on this occasion, from the strictness of his forty days' fast. During our journey, hitherto, he had lived in the most abstemious manner, on tea, and flavourless dried fish, and most conscientiously deemed the plumper salted omuls to be too nutritive; he was, in consequence, visibly fallen away and weakened, and his face had got an unhealthy colour.

About three o'clock we took leave of our courteous host, after we had looked at some of the sliding mountains in the town, remaining from the butter-week. Our sledges were well horsed, and here again, it is the custom, as on the Obi, to yoke the horses *gusem*, that is, goose-wise, or one before the other. As we were approaching the Lena, I remarked from a distance, high rocks on the left bank, of such jagged and broken forms as we had never yet seen in any part of the sandstone valley. They rise at a place where the Lena, after running some distance eastwards, turns again to the northeast; and as we reached the spot, I recognised in them a compact, light-grey limestone, the strata of which were twisted in the most extraordinary manner, and broken, and here and there completely concealed by the irregular cracks. We then wound round the eastern point of this promontory, and saw, on its north side, the red sandstone manifestly heaped up at the foot of the enormous limestone mass. The two kinds of rock may be recognised quite close to each other. The strata of the sandstone are likewise somewhat bent, but by no means broken to pieces. They sink, indeed, a little from the mountain northwards, but, bending gradually, they become again, at a little distance,

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perfectly horizontal. On the right bank of the Lena also, there is a limestone rock, which is manifestly connected, under the water, with this promontory. It juts out steeply, in like manner, above the red strata heaped against it on both sides.

In the part of the valley which now followed, the goitres seemed to have attained their greatest frequency and development. I observed, among other cases, a swelling of this kind, of the size of the head, consisting of four distinct tumours, on a boy about twelve years old in Gorbovsk *, forty-five versts from Kirensk. In this instance, too, it was confidently maintained, that there was a predisposition to the disease born with the sufferer, and that it developed with increasing years. In this place there are no new arrivals of convicts. In confirmation of their opinion respecting the hereditary transmission of the goitre, the inhabitants urged the fact, that lower down in the valley, where convicts are again found mingled with the natives, there is no example of the disease among the former.

The Russians at this place gave me to understand, that, for permission to hunt, they pay a tribute to the Shulengin or petty chief of the Tunguzes, whose district they visit: for the Tunguzes, as they added by way of explanation, are men of sense and enlightenment; they stand firmly on their rights, and accost Russian hunters in their forests, with "Who has invited you here?"

To-day again the local heating of the air between the close walls of rock, was very perceptible, for when the sun was low, all distant objects seemed to be in vibratory motion, whenever we looked from a shaded part of the valley into one that was in the full sunshine.

* It is to be remarked, that the name of this place, which is derived from *gorb*, a knob or tumour, alludes to the frequency of goitre.

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March 27. — About nine o'clock in the morning, we reached Ichora, the seventh stage from Kirensk. This village, like most of those on the Lena, consists of not more than eight dwellings. The people here are poor, yet they gave us good carp, which Mitléyev dressed in a way simple, indeed, but still worthy of recommendation. He slit the fish in two, sprinkled a little salt on it, and then laid it on straw or paper to bake at the mouth of the oven. Here, too, I got some capital glue, which the inhabitants prepare for their own use from the spinal marrow of the different kinds of sturgeon. This was to me a matter of great importance, as it enabled me to repair my barometer. For this purpose, and that of making the usual magnetical observations, I staid in Ichora till midday.

On the following part of the road the Kirensk limestone showed itself in extremely abrupt and fine looking cliffs; the overlying sandstone had now disappeared. The valley continued to be confined and narrow, and, as the sun went down, the remarkable twinkling in the air appeared under the same circumstances as yesterday. Between Chastinsk, twenty-two versts from Ichora, and the next station, Dubrova, we again took a short cut over a mountain, thickly covered with pine woods, on the right bank of the Lena.

March 28. — We reached the summit of this ridge at daybreak, so that I was able to read the barometer on the spot, and to determine its elevation to be 212 feet above the Lena, or 860 feet above the sea.

In the valley at Dubrova I again inquired respecting goitres. They were well known, yet much rarer than in the villages higher up, and I saw no more of them on the following part of the road. Thus we had reached, in our descent of the Lena, the lower limit of the extension of this remarkable phenomenon, without procuring any satisfactory explanation of its

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cause and origin. Much did I wish, at that time, for the opinions of those scientific men who have devoted many years of observation in Europe to this mysterious subject; and I am now quite convinced that the six octavo volumes comprising the original literature which relates to the endemic goitre, and the cretinism originating, either in this or in the same causes, furnish nothing more than the following results:

In a fertile plain, abounding in water, confined on both sides, or, at least, on one, by rocky heights, and at an absolute elevation, at the utmost, of 3000 feet, the air wanting free circulation, is, in summer, sometimes heated to an extraordinary degree, and loaded with moisture to an unusual extent. It may, in these respects, as well as in regard to its less known qualities, be compared to the air in hothouses. An atmosphere modified in this way is known to be always extremely favourable to vegetation, but owing to some unknown noxious element in its constitution, it infallibly produces cretinism. At first, while its influence on the human organisation has not yet been continued long enough, goitres only make their appearance. These increase from generation to generation, until having attained a certain size and prevalence, they become the cause, or, at least, the certain forerunners, of complete cretinism. We further know, that the goitre is a disease of the thyroid gland, an organ, the function of which, as Foderé conjectures, is to keep the windpipe flexible, by supplying it with mucus. But Coindet, the most eminent of the physicians who have especially devoted themselves to the treatment of goitre, asserts that its use is unknown. Cretinism, on the other hand, is a malady of the brain and nerves, attended with malformation of the skull, which seems to be always preceded by that degeneration of the thyroid gland, as if by its cause.*

* In support of these views it will be sufficient to name H. B. Saus-

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When we find in the valley of the Lena, from Petrovsk to Dubrova, goitres so far advanced that cretinism, in conformity with Foderé's experience, must speedily ensue, — though intermarriage with newly-arrived convicts, or with the Tunguzes, may help to check the development of the disease, — this fact cannot surprise us when we consider the results above stated. This region, too, furnishes, in the completest manner, particular confirmations of the general inferences above stated. The stagnation of different strata of the air, intense heat from the sun, and great humidity, were all to be recognised, even now, in winter, from local gatherings of clouds, from snow storms in some windings of the valley, and irregular refractions of the light. In the heat of summer, all these peculiarities must be much increased.* The great influence of the cliffs on temperature, can be best understood, perhaps, in a general way, from examples on a small scale, and of a more familiar kind. Since the houses in the streets of towns check the cooling by night to such a degree that dew is never heard of in them, and since they also weaken all the more general movements of the air so as to make them hardly perceptible, there can be no doubt as to the effect of valleys like that of the Lena, in which similar conditions favourable to stagnation, the same obstruction to free circulation, extend through a

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sure, Voy. dans les Alpes, 1786, vol. iv. in particular; Ackermann, Ueber die Cretinen (on the Cretins), Gotha, 1790; J. and K Wenzel, Ueber deu Cretinismus, Vienna, 1802; Foderé, Traité du goitre et du crétinisme, à Paris, an VII.; Bramley, in the Trans. of the Med. and Phys. Soc. of Calcutta, 1833, vol. vi. p. 183.; Coindet, Ueber den kropf (on the goitre), Annalen der Physik, 66, p. 238.; and for the reasoning on the subject, Troxler, Der Cretinismus und seine formen, &c., Zurich, 1836.

* The atmospheric phenomena of the valley of the Lena, recall to mind in every particular, the excellent description of the Cretin valleys in the district of Salzburg, given by Wenzel in the volume cited above, pp. 4—6.

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distance of 400 miles. The luxuriant growth of trees which Foderé found to accompany cretinism in the valley of Maurienne, distinguishes also all the hollows in the rocks along the valley of the Lena; for here, between the parallels of 55° and 57°·7, and close to the coldest meridian on the earth, a variety and beauty in trees of the pine family must be allowed to be as remarkable as the pistacios and laurels at the foot of Mont Cenis. And, with respect to this influence of close valleys on vegetation, there is a striking example on the small scale; I allude to the artificial valleys, or glens, used for forcing fruit in Russian gardens. The goitres on the Lena are most conspicuous between 1115 and 645 French feet above the sea, showing another instance of agreement with experience in Europe, where the height of 1170 feet above the sea appears to be the most favourable for cretinism, and that of 795 feet to be the lower limit of the phenomenon. Equally analogous are the facts that single villages here, as Turutsk and Rijnaya, enjoying an apparently favourable situation under the warm rocks, and among copious springs, are more subject to goitre than the other villages near them; that women are affected by this endemic degeneration more easily than men, while adult strangers, though living within its limits, escape altogether.

This region of goitre, though agreeing in many particulars with what is known of the disease elsewhere, is also in some respects peculiar. In the Alps, it is generally maintained that every goitre diminishes in winter, and consequently, exercise in the cold air is thought the best preservative against the germinating malady. But here it is far from being sufficient. We had tolerably clear proofs of the winter cold in these quarters by temperatures of —24° R., which we felt even now at the commencement of the spring; and, although the peasants here with goitre are, like

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Russian peasants in general, very fond of heated rooms and the warm place on the stove, yet, on the other hand, they never shrink from their constant occupations in the cold air. They go hunting in winter for several weeks, and sleep during that time in the open air. Perhaps we must assume that the cold is deprived of its beneficial influence by the great degree of moisture which accompanies it here in the valley of the Lena, quite in contradistinction from the rest of Siberia.

It is, further, well worthy of consideration, that in this case not quite two centuries have been sufficient to bring a perfectly healthy breed of Russians to the very brink of cretinism. We are here, therefore, much nearer to the mysterious causes of the evil than among the ancient population of the Swiss Alps, or even than in the Pyrenees. In these mountains cretinism is said to be much more recent than in the Alps; but yet it may be traced in them back to the eighth century, when it attacked the Visigoths, who had been driven by Clovis into the valleys of that chain. In conclusion, we learn from the valley of the Lena, that the opinion of M. Bramley, that the conditions of the growth of goitre in Nepaul are quite different from those in Europe, is at least not extensible to all parts of Asia.

One of the inhabitants of Dubrova travelled with me in my sledge from that place, a distance of ten versts, to look after some squirrel traps which he had set in the woods by the side of the valley. He took with him lúiji, as they are called, or snow shoes, without which it is impossible here to travel on foot in winter. They are two long boards, bent into a shape somewhat like that of a canoe, which serve to prolong the soles of the feet behind as well as before. Further on, I shall have to speak of their nature and use more particularly. Fish were used for bait in the traps,

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and dried omuls are so especially suited to that object, that the Russian hunters frequently send to purchase them. Our companion further related to me, that the squirrels here are red in summer, when their hair is loose and skins good for nothing. They are hunted, therefore, only in winter, and in this season are sometimes black, sometimes bright grey. The former bear the highest price, and are frequently met on the mountains to our right, or south of the river, while none but grey squirrels are found north of the Lena. The hunters here, too, are of opinion that this difference depends on the nature of the forest.

It was also a curious thing to learn that the Russians here hunt without firearms, whereas their Tunguzian neighbours, collectively, are supplied with them; for by that means the indigenous inhabitants seem to be once more the lords of the soil, and the Russians to be only tolerated by them. The bears are killed by the Russians only with lances; wolves are said to make their appearance here but seldom, yet on the mountains towards the north are numbers of rein-deer, which in Western Siberia are always followed by those animals. The glutton, also (*rossomága*), which peoples these forests, is killed only by the more fortunate Tunguzes; but, on the other hand, the chase of the river otters is a profitable business for the Russians. They are numerous in the rivulets which flow into the Lena. On land these animals are very inactive, and are consequently easily brought to a stand by dogs. Their bite is formidable, and they threaten an obstinate resistance, till the hunters come up and dispatch them with clubs.

We met on the ice, before the Dubrova hunter left us, a Tunguzian in snow shoes, dragging after him a nart, or small hand-sledge. He and two of his countrymen had just fixed their quarters in the neighbour-

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ing forest, and awakened the envy of the Russians, as they were hunting with guns.

At the next stage, Kureisk, the post house, as well as its owner, had an extremely cleanly and pleasing look. The latter was a young man, who complained to me that, at the instigation of his lord or owner, he was ordered to this place from Novgorod, where he was born, together with his parents and two sisters. He was now left alone, for his relatives were dead, having already sunk under the hardships of emigration. I have not been able to learn whether these people were only *Brodyagi*, or runaways, who preferred exile in Siberia to servitude at home, or whether some new political occurrence afforded a pretence for sending whole families into exile.

There is a small bird here, kept in the cage for the sake of its song, which appeared to me to be hardly different from our European bullfinches. It is eaten also; for now, in winter, it appears with some other small birds, in immense flocks, and is caught in horse-hair springes on the snow. The individual which I saw was a male, a little larger than the house sparrow. His black bill was bluntly conical, and consisted of two perfectly equal parts, not crossed. His breast and belly were of a deep red, or cherry colour; his back ash-grey; his wings black, with a white streak. The female is said to have a grey breast. Pallas's description of the *Pyrrhula rubicilla* (Fauna Ross. II. p. 7.) agrees sufficiently well with this description, only that the grey colour of the female, which he considered as exceptional even for Siberia, is here, on the Lena, held to be universal.

We travelled from Kureisk on the right to Parshinsk on the left bank of the Lena, forty versts, without seeing a single human habitation. The limestone, which is now the prevailing rock, forms in many places very abrupt and naked walls. These are some-

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times formed of immense slabs, with north-west strike, and a steep fall to the south-west; then, again, this regularity seems all at once at an end, and the rocks are divided only by shapeless cracks. Naked faces of rock are again predominant on the northern side of the valley, and well wooded declivities on the southern. The hills of the right, or southern, side are rounded off, and separated by short and nearly equal intervals; they are cut by parallel cross glens, some of which run down to the Lena, while others divide the ridge only to a little depth. I saw an immense number of springs, issuing from the right side of the valley in particular. They had all melted the snow on their way to the river, so as to expose to view the dark earth.

The internal cleaving of the limestone, which is recognised at once by the form of the hill, appears to be favourable here, as on the western side of the Ural also, to an unusual abundance of springs. Our driver told us, that between Parshinsk and the next stage further on, the copious waters springing from one rock flowed off in five branches, like so many little rivers. It was dark before we came to this part of the valley, as I devoted some hours in Parshinsk to magnetical and geographical observations.

During the night we got over only two stages, for the way on the Lena was difficult in the extreme. The snow lay three feet deep on the ice, and my sledge was twice overturned by sinking unequally in the loose covering; an accident here called, by a proper technical name, "sledge-cutting." There was, however, a well-beaten path in this snowy tract, but only for narts and single horse sledges of much narrower gauge than mine.

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CHAP. XIV.

VITIMSK. — MICA QUARRIES. — PESKOVSK. — OLENSK. — WINTER THUNDER NEAR THE LENA. — YERBINSK. — LINE OF NO DECLINATION. — PROGRESS OF THE YAKUTS. — THE CAVES OF YERBINSK. — KAMENOVSK. — THE YAKUTS OF NOKHTUISK. — LIMITS OF RYE AND BARLEY. — MANNERS OF THE YAKUTS. — NELENSK. — DANGERS OF THE ICE. — YAKUTIAN YURTS. — OLEKMINSK. — COMMERCE. — PREDOMINANCE OF THE YAKUTS. — SINSK. — THE POST TO IRKUTSK. — ABUNDANCE OF CATTLE. — A YAKUTIAN CHIEF.

March 29. — We arrived a little after sunrise in Vitimsk, the volost or chief place in the circle, the black, one-storyed houses of which form a handsome row on the left bank of the Lena. I staid in the post-house at the northern end of the place, exactly opposite to the mouth of the Vitim, which here joins the great river. There are two traders living here, who take the furs from the Russians and Tunguzes in exchange for some European goods. Still more important, however, is the trade in mica for window panes; for at present all Siberia is supplied with this desirable material from this quarter. The traders of Vitimsk send every year a hired party of Russians to the mica quarries, which lie, as they told me, in the valley of the Vitim, about 200 versts up from the mouth of the river. Some of the workmen, who had been engaged in these expeditions, gave me brown plates of mica, from one to two feet square; and in answer to my inquiries after the fossils accompanying the mica, they added garnets, bits of amethyst, and a black horn-stone, which had penetrated woody stems, with branches and twigs, and had taken all their forms with the greatest nicety. If we may assume that

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these latter are attendants on, and indicators of, the window mica, then we may conclude that there, too, the granite is in contact with stratified rocks, and, probably, with the widely extended carboniferous formation of the Sabaikalian system.

Some fragments of mammoths' tusks were also offered to me here. The people wanted to sell them by weight at the rate of a rooble the pound. The clefts, in the enamel of these tusks, were covered with blue phosphate of iron.

The Russians of this place are classed in the census, either as settlers or as promuishleniks; that is, people moving about on business, whether hunters or traders. The latter are required to pay a yasak, or yearly tribute of five squirrel skins for every male; but this tax is levied, as I was assured by an old exile in Vitimsk, only on the men actually employed in hunting, and not on young boys.

For the next fifty-four versts, the stages of Peledui and Krestovsk are the only inhabited places, and, for the first time on the Lena, the whole country around has an extremely dismal and desolate appearance. The mountains are all rounded flatly, and covered with wood; on the left, they often disappear altogether. The best looking things on this part of the journey were the fire-places of beaten clay, which I saw in the houses of Krestovsk for the first time, instead of the stone-built ovens of the Russians. They were copied from those of the Yakuts, but resembled exactly the Ostyak fire-places in form and arrangement.

During the next stage, Peskovsk, and those that followed, the fire-places, giving both light and heat, were quite universal. The Russians call them komelki; the Yakuts, ósok: and no one seems to know the Tatar name chubàl, which is in use on the Obi. In the public room at Peskovsk we found a mixed company of Tunguzes and Russians, and took a part in their

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singular debate. A sick Tunguzian woman, still young, was lying there on the ground near the fireplace, and was listening with visible anxiety to a dispute, the direct opposite of the famous Trojan quarrel. Her husband, a Russian, had died not long before; she was, thereupon, handed over to her Tunguzian kindred to take charge of her; but they refused to do so, and had now sent her back to her husband's district. Besides the Tunguzes who had brought back the sick woman, the Russian elder of the circle was also present, and he decided on sending back the woman a second time, and, definitively, to the yurts of her fathers.

The Tunguzes here call themselves Ovonui; and the Russians, Lúchi; as I was informed in Peskovsk by a Tunguze who spoke Russian well. There are many of them here possessing the same accomplishment, although there are but few instances of the converse, or of Russians learning the Tunguzian. The Russian talent for languages, however, is so much the more conspicuous in the intercourse with the Yakuts who are settled, and constitute, as far as the interests of the Russians are concerned, a far more important race. The peasants here, beginning in Peskovsk, as in the country of the Ostyaks, all speak, besides their mother tongue, another, which is more confined to intimate and private use. They spoke Yakutian to one another, partly that we might not understand them, and partly because a number of Yakutian cant words are become indispensable to them. We had showers of snow to-day, with a westerly wind, and a temperature not far removed from the freezing point.

March 30.—In Kantinsk, seventy-seven versts from Peskovsk, and in the following stages, the Russian population is mixed with more than an equal proportion of Yakuts. These are far more successful fishers and

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hunters than the Russians, and we were always sure of finding in their yurts a good stock of carp and other fish. Many of them have grown rich by barter, while the Russians here, by their own confession, find a miserable subsistence.

In the course of the day, and during the following night, we went a distance of 140 versts, through Bukhturminsk, Murierinsk, Sunduki and Nyuis, at which places the sides of the valley again display their former height; and 15 versts below Murierinsk, on the right, stands a naked cliff, which must have an elevation of 500 feet at the least, for I saw it plainly as we left Bukhturminsk, at a distance of forty versts.

I purchased of the Yakuts in Murierinsk a supply of carp, which furnished us with some good dinners in the following part of our journey. Most of these fish were now swelled with roe to double their ordinary size, and many of them were very large independent of this circumstance. The method adopted here for carrying them is to run a stick, about two feet long, through the middle of the body, so as to sustain a great number of fish with their flat sides close together, while a crook at either end prevents their falling off. They are taken in the lakes belonging to the Yakuts on the northern side of the Lena, and, consequently, the Russians on the river have only as many of these fish, as those original and more practised lords of the soil allow to escape to them. The latter, however, carry many hundred poods of this fish for sale into the upper part of the valley.

Mitléyev left with the Yakuts in Murierinsk, a packet, which was to be forwarded, from hand to hand, to the settlement of Olensk, which lies northwards in lat. 63°·8. This is, as they term it, a place of the Yakuts, where several Russian merchants,

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with a priest of the Greek Church, reside for the sake of trade. In the older Russian maps, in truth, is found at this place, on the river Olenek, the following indication—"Projected city of Olensk;" and close to it are marked the dwellings of the Yakutian princes, Khariton Shishkin and Muishkapan Okin, along with the yurts of their people. When modern maps, on the other hand, represent the banks of the river as almost wholly depopulated, I cannot help thinking that this confession is somewhat premature, for even now the Yakuts of Murierinsk look upon their prosperity and thriving condition as the consequences of the trade with those of the same race who live further north.

Sunduki and Nyuis are likewise Yakutian villages, with a small share of Russian population. The dwellings here are extremely neat, and both the food and clothing of the people bear witness to their comfortable circumstances. The women generally, wear in the house, a gown of some coloured web; the men wear short over-coats of rein-deer skin, with the hair turned in, and the outside leather coloured. A young Yakutian woman replied to me, with great naïveté, as I was commending her housekeeping, "That all the Russians now seemed to think as I did, for they were no longer above marrying a Yakut." In fact, the envy which the opulence of the Asiatics has usually awakened in the minds of the European invaders, takes here the deceitful appearance of esteem. The Russians flatter the strong, because these will not allow themselves to be imposed upon.

The lowest temperature to-day was —2° R. The morning was cloudy, and snow fell a little before noon. After that the sky became quite clear, and continued so for half an hour, till we found ourselves beyond Bukhturminsk, between high cliffs. Then there came on suddenly a gust, with a whirlwind from

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the west; in a few seconds the upper part of the heavens was covered with thick and heavy clouds. Before us dark streaks hung down from the edges of the lowering masses, without touching the horizon, and while I was thinking how like this looked to a summer hail-storm, we heard, all at once, the rattling of the falling stones, and were overwhelmed with compact and heavy pieces of ice. They had the form of tetrahedrons, three lines long on each side, and, when crushed, broke into regular triangular laminæ. They wanted only the rounding off of one of the surfaces which is usually seen in summer hail. Taken in conjunction with what I thus experienced myself, some meteorological statements of the peasants in Dubrova seemed important. They told me that in their country there were hail storms in winter too, and in answer to a question of mine, they asserted, that they had also known instances of thunder and lightning in winter; such a storm had occurred, for instance, the preceding year, about Christmas, with mist, after very severe frost. On the north-west coast of America, indeed, where the humid and warm sea air falls on the cold land, I have known hail and electric storms in winter, but such a phenomenon in the middle of the continent was quite unexpected. Storms of this kind are unknown in Irkutsk and in Yakutsk, and must therefore be regarded as local effects of the air issuing from the narrower parts of the valley. In fact, the suddenness of congelation and precipitation which gives rise to hail and electric clouds, suggest themselves to the mind when we think of the humid air from between the cliffs, with the much colder air of the adjacent plains; and, accordingly, winter hail and winter thunder-storms appear to characterise the region of goitre on the Lena, as distinctly as the absence of summer hail characterises the valleys of the Alps where cretinism is most prevalent.

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March 31.—We arrived in the morning at the Russian houses of Yerbinsk, thirty-five versts from Nyuis, which lie on the left bank, in a fertile opening of the valley encircled by hills, on which pine woods are intermingled with bare rocks. On the way here from Irkutsk, I had hitherto always observed a very weak eastern declination of the magnetic needle; we were therefore not far from the line of no declination. Here, in Yerbinsk, it was apparent that we had crossed that line yesterday for the third time in the course of our journey, and that we were now again, as we had been in Kiakhta and in Europe, in a division of the earth having a western declination. An old Russian, from the vicinity of Murom, who had been banished to Yerbinsk some fifty years before for homicide, complained to me, with laughable impudence, of the progressive improvement of the Yakuts. Formerly, these people paid for every pound of flour, with the finest furs, but now they hardly paid as much for a pood; and so it sometimes happened that they laid up a stock of flour, and then, in the winter, retailed it to the Russians. Indeed, when he first came here, every Russian passed with the Yakuts for a superior being,—they have even stood to salute him at a respectful distance; but matters were at last nearly come to that pass that he would have to bow to the Yakuts.

Ten versts beyond Yerbinsk we saw, at a great height above us, on the left side, a black-looking, circular hole in the precipitous face of the limestone rock. This is the entrance to the caves of Yerbinsk, which I had often heard spoken of in Eastern Siberia, but never exactly described by an eye-witness.* I

* I have learned from M. Hedenstrom, who visited the cavern of Yerbinsk with Laxmann in August, 1808, that its walls are covered in the interior with smooth ice. The facility of access which it afforded to antediluvian beasts of prey, would lead to the conjecture that it contains deposits of bones.

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hoped to be able to reach them from the river, but found it impossible to climb on the frost-covered rocks, which were continually growing steeper, to more than half the height. The closer examination of the rock afforded me some compensation for the failure. Even from a distance the strata of the limestone are easily distinguished. They are inclined very steeply to the southwest, and each cleft of separation, visible on the face of the cliff, is covered with a raised and dark-coloured streak of compact brown ironstone. The cause of this remarkable appearance I detected immediately on breaking the adjacent limestone. Throughout this is disseminated in great quantities cubical pyrites, which becomes converted on the surface into brown ironstone, and in that state is, to a great extent, washed away. Many of the cavities which formerly contained these crystals are now quite empty, and are only coloured brown on the sides; in others is found loose ochre, and, at times, a nucleus of pyrites. It is evident that this decomposition was effected by water, which had found its way in, and had left behind it the ore in solution on the clefts, through which it had flowed out again and evaporated.

Between these white beds of limestone rock, lie others of pale red colour. These latter contain certain roundish bodies, from a fourth to a third of a line in diameter, in such enormous quantities, that but a faint trace of solid limestone remains between them, and the whole rock may therefore be compared, very appositely, as far as appearance goes, to the roe of fish. But this rock is by no means to be confounded with what is called, with little propriety, roestone, nor with those oolitic strata, the granular texture of which is due only to the settling down of the calcareous mass on the grains of sand suspended in the fluid from which it was precipitated. But in this lime-

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stone of Yerbinsk, each of the egg-shaped grains is filled completely with calcareous spar, which shines brightly at the fracture, and is always of a deeper red than the surrounding stone; just as is the case with the petrified limbs of the encrinites and other animal remains in limestone.

In the midst of these remarkable remains, and set up perpendicularly on the joining surfaces of the strata that involve them, are to be seen small stylo-liths, resembling those of the shell limestone.

In this part of the valley, as well as lower down, the appearance of the limestone at the height of about fifty feet above the Lena, is always very different from that at the foot of the cliffs. It is there of a deeper colour; the inclined joinings of the strata cease to be covered with iron; they even disappear entirely, and on the uppermost parts of the cliff they are superseded by other cracks standing perpendicularly. In this part of the valley caves seem to be very frequent; and a little below that of Yerbinsk, and at the same height on the cliff, I saw another opening, of greater length, cutting perpendicularly through the strata, and evidently going deep into the rock.

The next stage, Kamenovsk, thirty-five versts from Yerbinsk, has a situation at once remarkable and picturesque. In the middle of the Lena is an island, about 150 feet high, which has all the appearance of being an immense block torn off from the left bank of the river, for both banks of the Lena are bordered here, again, by the limestone. The cliffs on the left bank rise perpendicularly to a height of 300 feet; the rocks on the right are lower, and present declivities covered with trees. The remarkable rocky island between them occupies about a third of the whole breadth of the valley. It is highest on its left side, opposite the steep precipice, thus presenting perpendicular crags towards the left, and a gently inclined

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and woody plain towards the right arm of the Lena. Its side facing up the river consists, also, of naked rock, and shows a strong inclination of the strata to the south-west. A number of exiles have established themselves in three huts on the gently sloping shore of the island, and under the shelter of the handsome pine woods overhanging it; a fourth hut is occupied by a burgher of Irkutsk, who makes this the centre of his fur-trading operations.

We came in the evening to the yurts of Nokhtuisk, fifty-five versts from Kamenovsk, which are inhabited by very thriving and intelligent Yakuts. Several of the men whom we met in the post-hut spoke Russian fluently, and were proud of this advantage. One of them, who had travelled several times to Irkutsk, entered into an argument with Mitléyev respecting the age of Yakutsk and Irkutsk. The Yakut maintained, and with reason, that the former of these capitals was first founded; but it was not till he said to the Kosak, "Siberia was conquered 250 years ago, under the Tsar, Ivan Vasilevich," that his learning was formally eulogised with the words, "Now I see that you have read the history of Siberia."* The same Yakut said, in reply to a question of mine respecting the relationship existing between his nation and the Buraets, that they were both of one descent, and that their languages were still very much alike. In saying this, he referred only to the present inhabitants of the sources of the Lena, whom he had seen himself; and in confirmation of his statement, we find that in the beginning of the seventeenth century (1630), when the Yakuts were just beginning to make the acquaintance of the Russians, they preserved the tradition, that they had dwelt at one time in the upper valley, close to the Buraets and Mongols, and were at length

* This man had probably received instruction in the public school of Yakutsk.

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separated, in consequence of a war, from those neighbours and kinsmen, and driven back into their present abodes.

April 1. — We arrived about seven in the morning at Beresovoi Ostrov, or Birch Island, fifty-six versts from Nokhtuisk. The place so called contains a single very comfortable farm-house, built by an old exile from the government of Nijegorod. This active man was now supporting a family of eleven persons, and supplied, by persevering industry, what the rigorous climate seemed to deny. Behind the respectable looking dwelling-house, he had built covered stables for cattle and horses, instead of the enclosures generally found in Russian villages; and he had also a supply of hay for the whole winter, part of which he brought a distance of twenty versts, from some low and luxuriant islands in the Lena. Rye and barley yield good crops in this place, and our host laughed at the prejudices of the lazy farmers who looked upon Kirensk as the limit of the growth of corn. Cabbage and turnips grow in a garden close to the house, and gherkins also are reared in beds from seed, which is made to germinate during the spring by means of hot-beds and artificial warmth. In the construction of the house and stables the example of the Yakuts was here followed, for the wooden walls were plastered on the outside with cow-dung.

In the isba or family-room of the house, we found a number of fowls in coops along the wall. The gornitsa or master's room, on the other hand, was decorated with fine pictures of saints, and lamps before them. On the walls, also, were some wood-carvings and coarse paintings, such as may be constantly seen in the villages of European Russia. Among the rest I observed a favourite satirical subject, viz., the merry mice, who, having waked the cat, are trying to carry the coffin to the grave.

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This exemplary management in Beresovski Ostrov, may possibly be on a level with the husbandry of the Yakuts in this country. The Russians themselves, however, will not admit the existence of any such equality, but assured me that many of the indigenous race were far more rich; the Yakuts who live north from this place, on the Vilui, are often unable to count their herds, so numerous are their cattle.

The Lena, which from Kamensk to Beresovski Ostrov flows south-eastwards, here turns suddenly again to the north-east, compelled evidently by the character of its banks. On the left of the river, through the following reach, lies a low plain, on the right, steep cliffs, including the Harp rocks, as they are called from their streaked appearance. They consist of horizontal strata of red and greenish marls.*

At Delgeisk, the next stage, an old Yakut told me many particulars respecting the present manners and customs of his people. "Here, in the neighbourhood of the Russians, every one contents himself with one wife; but, among the families of the northern tracts, polygamy is as prevalent as ever. The old custom is kept up in regard to what is called the kolùim, or the sum for which every Yakut buys his wife. This is usually a number of cattle, to the value of 200 or 300 roobles; but as the family of the man are not always in a condition to pay the stipulated amount at once, it is customary to affiance the boys already in their twelfth year. The betrothed girls may be visited in their parents' yurts by their intended husbands, but cannot be taken home by the latter till the payment of the kolùim is completed. The sum thus paid goes wholly to the father of the bride, who carries only a

* I obtained in Yakutsk specimens of other rocks which occur in this valley. At Delgeisk there is a limestone of later origin than that of Kirensk and Yerbinsk; and between Delgeisk and the Olekma there is a white and much decayed quartzose sandstone.

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few presents with her to her new home. Match-makers, male and female — the svàti and svàkhui of the Russians — are indispensable as witnesses in settling the price of the bride." Many of the Yakutian words, written from the lips of this man, showed no essential agreement with the equivalent terms of the Sabaikalian Buraets, as given by Mitléyev. On the other hand, I remarked in the yurts here many remarkable resemblances to the manners of the Ostyaks on the Obi. Thus the fire-place, the most important part of all northern dwellings, is constructed by both tribes after the same idea, for it consists here, as on the Obi, of a wicker frame plastered over with clay. The only difference is in the position of the apparatus, for the back of the fire-place is placed by the Ostyaks close to the wall of the house, whereas the Yakuts always leave room for a man to pass between their fire-place and the wall. The flue is therefore perpendicular in the yurts on the Obi, whereas in those of the Yakuts here they lean backwards, at an angle of 30°, so as to form a continuation of the burning logs, which are placed in a similarly oblique position, resting below on the bottom of the fire-place, and above, on the mouth of the flue. This deviation from the Ostyak mode of construction is evidently advantageous, for here, the moment the fire is kindled, a strong and audible draught is perceptible, with a bright flame; but in the yurts on the Obi there is more frequently pungent smoke with a dull fire.

The ermine-traps, too, which the Yakuts of Delgeisk showed me, prove that, at some time or other, important traditions have found their way from Obdorsk to this part of the Lena. They corresponded perfectly with the *yugel*, as they are called, or self-shooting bows, which I found in use for the same purpose in Kunduvansk; the only difference being

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that the opening for the ermine is circular in the Ostyak trap, and square in that of the Yakuts. It cannot be assumed that two inventors, independently of each other, hit upon the same mechanical contrivance, which is by no means simple.

Russian settlers live in Nelensk, twenty-five versts from Delgeisk. We arrived there after sunset, and were advised by the carriers to go no further during the night, as water had already gushed from the ice twenty versts lower down. They told us of some peasants who left this place the preceding evening, that they had had a very narrow escape, and had turned back to the nearest yurts of the Yakuts, leaving their business undone.

In the room where we spent the night, there were again two kinds of small singing birds in a cage. They are caught for the sake of their well flavoured flesh; but these individuals were kept because they happened to be taken alive in the springes. One of them was a female bullfinch (*Pyrrhula rubicilla*), with white breast, a white streak on the bluish-black wings, and bluish-black head. The white parts of the body, they told me, change to grey in the summer; the rest remains unaltered. They are here called *sniegiri;* that is, mates of the snow-hammer (*Emb. nivalis*), with which they associate in winter. The other kind of bird seen here was called *klest*, a name which it owes to its tongs-shaped beak (from *kleschi*, tongs); this was a dark red variety of the *Loxia curvirostra*, or our common cross-beak. The point of the lower jaw was, in the individual seen here, to the left of the upper one, when the bird was viewed from the front. I bought some of these birds from my host, and the other peasants began now to lament that they had not been sooner apprized of our coming, that they might have collected for sale animals of all kinds. A dead letyaga, or flying

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squirrel, was the only thing of the kind brought to me. It had entered, as is often the case, the trap intended for common squirrels. It was bright grey all over, like the ordinary squirrel in winter, and the broad wing-like membranes were still to be seen extended, which differ by having hair on both sides, and by their much greater thickness, from the otherwise similar organs of the bat. In other respects the animal was much disfigured, having been thrown away as useless, and only accidentally preserved by the cold.

April 2.—From Nelensk to Olekma we left the ice for three stages, and a distance of ninety-five versts, and travelled through a marshy plain on the left bank. We first met with some Yakutian yurts, with flat roofs covered up high with earth, and surrounded with hurdles, within which the cattle are kept in summer, and then we came to the dangerous spot of which we had been told yesterday. We were obliged to cross a rivulet, which here, at its junction with the Lena had a considerable width, and which had destroyed not only its own ice but the adjacent ice of the great river. Yet the temperature of the air was still only —16° R., as we were leaving Nelensk. The peasant who drove us went on before, from the bank, with an axe and tried the ice in various places. At last there was found across the middle of the rivulet a covering, three inches thick, over which the horses with the sledge were led circumspectly. At another place near the bank, the brook was covered only with hollow snow, in which one sank at every step. I saw, through the holes formed in it, extremely beautiful crystals of ice on the side of the snow next the water. They were low hexagonal columns, with funnel shaped cavities, also hexagonal in their lower surfaces.

The early thawing of this and other small streams flowing into the Lena, and, in like manner, of the affluents from the Uralian chain to the Obi, takes

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place every year. There is no mode of explaining this remarkable phenomenon but by supposing that springs issue from the rocks, the temperature of which is above the freezing point, and consequently in these cases very much above the mean temperature of the ground.

The tract of country which follows is well peopled with Yakuts, whose winter dwellings always stand alone, in wide grassy lawns, in the midst of the prevailing pine woods. Here, too, the rectangular wooden huts are flat-roofed and plastered with cow-dung; and the doors, for want of planking, are covered over with hairy ox hides. Flakes of ice fill the windows, yet in some of the yurts, bladder is used instead of these. The Yakutian sledges, which we met with continually, were, like those of the Buraets, drawn by oxen, on one of which the driver rode. At the same time horses have been used here for riding from early ages, as is proved indeed by the peculiarities of the Yakutian horse furniture. Their saddles have unusually thick stuffing, on which the rider sits, squeezed in between two high and perpendicular boards. The white colour of the horses decidedly gains ground here, along with the Yakutian population.

It is only when we have just reached the Russian town, at the mouth of the Olekma, that the character of the country changes. Here a broad range of hills, striking to the north-west, again approaches the left bank of the Lena. Their south-western slope discloses snow-white rocks of gypsum. These are divided by horizontal and perpendicular cracks, into large, roundish blocks; the projecting ledges being strewed over with red marls, which cover also the upper surface of the hills.

The wooden houses of Olekminsk form a few short but pretty looking streets, parallel to the course of the Lena. We saw in the wooden market-hall only

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one shop at present open and in use, but the others we were told are also filled in summer, when the navigation of the river gives life to the barter.

April 3. — The only officers of the government in Olekma is an Ispravnik, or councillor, and his clerk. On the other hand the place derives importance from the activity of its inhabitants, who are all traders. The merchant, Nikitin, with whom I was lodging, told me of a frequent intercourse with Verkhnei Viluisk, situate in lat. 63°·15, and under the meridian of Olekma. A convenient bridle road conducts to that town, the environs of which are rich in valuable minerals among other things. The springs of the self-depositing or saturated salt lakes on the Upper Vilui, and the white, red, and blue rock salt brought from that place, evidently belong to one and the same system with the great gypseous range which strikes north-westwards from Olekma, and from which numerous salt springs issue even here. They are no more to be considered as superficial remains of one of the last universal floods than the brine springs of Ustkusk. I also heard here of an iron ore, roundish masses of which are found at Vilui. It is said that the Yakut smiths used to smelt it, before the Russians came here, and the ore is on that account still called *chugùn*, or casting iron. Pieces of it, which I saw in Tobolsk, were very far, nevertheless, from being pure iron. They were nothing but a mixture of earthy brown iron ore with specks of the pyrites from which it was probably formed. Its chemical constitution brings to mind the ore at Yerbinsk changed by decomposition from exposure to air and moisture, and also a similar phenomenon in the limestone on the western slope of the Ural; but the metallic pieces of Vilui are always much larger than those thin and streaky stalactites.

The merchants here have constant communication

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with the markets of Kiakhta, of Irbit, and Makáriev, as well as with the fur traders of Moscow and St. Petersburg, the sables from the Olekma and the Upper Vilui having been at all times esteemed the best. But besides the great Siberian road, there are others not so well known, conducting into the valley of the Lena. From the upper part of this valley, and more particularly from the part under the meridian of Boyarsk, Tunguzes go every year to the nearest bank of the lower Angarà, where they meet with trading vessels from Irkutsk. Others proceed across the mountains below Kirensk on the lower Tunguzka, to the fair of Turukhansk, while towards the south, direct communications exist at many points between the Chinese frontiers and the valley of the Lena. These are maintained by exiles, who make their escape not unfrequently from the mines of Nerchinsk to the Lena, and still more regularly by the annual journeys of the sable hunters on the Vitim and on the Olekma, from the mouths to the sources of these rivers. I felt the most violent longings awakened as I listened to the accounts of the practicable roads, by which the Tunguzes of the Lena may, in one and the same year, receive information from China, then meet in Turukhansk with Samoyedes who have seen Obdorsk, and there learned from eye-witnesses what was going on in Archangel. In conjunction with these nomades, Europeans can travel over the coasts of the polar sea with speed and convenience, and thence can cross, at whatever points they please, those chains of mountains, of which the Vilui and the Lena mark only the longitudinal valleys.

The merchants of Olekma, however, are far from being content with the present condition of their trade; they regard it as a great misfortune that the valley of the Amoor belongs to the Chinese. To say nothing of its great fertility or of the beauty of the

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sables found on the adjacent mountains, it is manifest that a suitable communication between the centre of Siberia and the ocean, can only be established by the navigation of this river. The Lena cannot supply this want, for all the advantages of the navigation to Yakutsk are more than counterbalanced by the difficulties of the land-carriage over the mountains to Okhotsk. These are the views generally entertained here, and I have heard their justness vindicated by a Russian officer in the navy, who was banished to Olekma in consequence of the political disturbances of December, 1826.

We left the town about four in the afternoon, and went at first through a forest on the left bank, twenty-five versts to Solyansk, where some salt springs issue from the gypsum. Then, during the night, we continued on the ice of the Lena, between Solyansk and Namana, a distance of forty-four versts.

April 4. — About six o'clock in the morning our sledge got so deep in the snow on the Lena, that we were obliged to let it stay there, and to ride our tired horses ten versts further to Namana. From thence we sent fresh cattle to bring us our sunken vehicle. The Yakuts in Namana, and along the road onward for 110 versts, as far as Sanayakhtàtsk, live still quite in their ancient, original fashion. Again, I found their yurts exactly like those of the Ostyaks; they are rectangular, flat-roofed, and fitted inside with what are here called *narui*, that is, raised and divided berths along the walls. The thick flakes of ice, which serve as window panes, were here also held against the wall from the outside, by a slanting pole, the lower end of which was fixed in the ground. In the night, when the fire goes out, this ice is covered, like glass, with an opaque and snow-like hoar frost, which in the daytime melts away, as well as a considerable portion of the ice itself, from the heat of the

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yurt, and the flakes, which are at first a foot thick, require to be renewed four or five times in the course of the winter; a provision of suitable ice always lying before the yurt. The parts of these dwellings which are directly heated by the fire, attain a temperature of +15° or +20° R.* We found the children in them of both sexes quite naked; they were, nevertheless, running about in this state to-day, when the thermometer was as low as —10° R., and even in the open air. In the clothing of the adults, there is manifested a strong predilection for bright colours, for the women in the house, as among the Buraets, wore clothes of green or other bright Chinese stuffs; while the men had on tight-fitting, short frocks, which closely resembled the esquires' tabards in the middle ages. They were almost always made of white linen, with blue borders. At the lower end, behind, was a perpendicular slit, to prevent their incommoding on horseback. Even the fur caps of these people were covered with white linen, and adorned with squirrels' tails, and other black furs.

The few Russians who live at these stations to superintend the post, speak nothing but Yakutian among themselves, and are distinguishable from the indigenous population only by their greater length of face, their fairer complexion, and the comparative poverty of their clothing.

April 5. — The sky was clear, and the thermometer sank again in the morning as low as —19° R. We

* It may be assumed that of the heat proceding from the fire-place, there is as much expended on the flake of ice as passes, on an average, through an equal area of the wooden wall. In a cubical yurt of 15 feet, the melting, in succession, of four flakes of ice a foot thick, shows that the whole amount of heat in 170 winter's days, would suffice to melt 5400 cubic feet of ice. The quantity of fuel required for this would amount, according to Rumford's experiments, if applied most advantageously, to 231 cubic feet of wood in the course of the winter, or about 87 lbs a day. The daily supply which lies near the fire-place in the Yakutian yurts, seems not to exceed this.

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came first to Sanayakhtatsk, and proceeded thence seventy-seven versts to Issit, where I made geographical observations, and spent the night. The valley throughout this distance is bounded by limestone rocks, which are cut perpendicularly above, and slope gently down to the river in the lower half.

Mitléyev gave vent several times to his horror at the Russians whom he met with at the places along this road, because, being among the Yakuts, "they had laid aside not only the Christian (*i. e.* the Russian) language, but also every Christian custom." They ate, forsooth, during the most solemn fasts, of the most strictly forbidden kinds of meat, without any shame, and excused themselves only by alleging the want of fish in the Lena. In the lakes lying around there were carp in abundance, but they fell all to the share of the Yakuts. The Russian women here were as passionately fond of smoking tobacco as any of the fair natives. The pipes used by the Yakuts, both men and women, are so small that a few whifs suffice to empty them. Their bowls are conical cups, of Chinese bronze, half an inch wide, and terminate below in a hollow and very thin cylinder, which is fixed into the wooden tube of the pipe. This is formed of two flat pieces of wood laid together, in each of which is cut half of the cylindrical canal. When properly joined, they are tied round with a thin strip of leather, which makes them air-tight. These pipes have the inappreciable advantage of allowing the tobacco oil which settles in the tube, to be collected; this, mixed with fine wood-shavings, is then smoked a second time.

April 6. — On the road from Issit to Sinsk, by Yurinsk and Onmuransk, are seen constantly on the left bank of the river perpendicular limestone rocks about eighty feet in height. They have the closest resemblance possible to artificial walls, for their green

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and red strata lie perfectly horizontal, and they are coloured with such regularity, that the same narrow stripe, only a few inches wide, can be sometimes traced for a distance of twenty versts, at exactly the same height above the surface of the ice. Perpendicular cracks run through these cliffs and divide them into squares. Between the base of the rocks and the water stand fir trees of superb growth; their lower branches are short and stunted, but their trunks are unusually tall and straight; they lean universally southwards towards the Lena.

In Sinsk I received many pieces of information having reference to my plans of travel, for the Russian superintendent of the post, who was living there with the Yakuts, had formerly resided in Okhotsk. He thought that there still remained enough of the favourable season, but advised me not to stay in Jakutsk above a fortnight.

We still went on between steep cliffs, but it was night before we reached Batamaisk, twenty-seven versts from Sinsk, where a part of the limestone rock, divided by remarkable fissures, is known as "the pillars of Batamaisk."

April 7. — In the morning I made the usual observations, at the yurts of Toyon aruin, a Yakutian name signifying "lord of the islands." This name has reference to one of the largest islands of the Lena, which has been formed here by the accumulation of the limestone detritus.

We cooked ourselves some fish soup in the pot in one of the yurts, and, to the delay thus occasioned, we owed the good luck of meeting with the postman from Yakutsk and Kamchatka. At my desire, he waited in Toyon aruin, till the frozen ink which I carried with me had time to thaw, and a few lines to friends in Berlin were written, and committed to his care. The courier, or paid overseer, who attended

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the mail from Yakutsk to Irkutsk, bore here, too, as the mark of his rank and office, a sword and a loaded pistol, hanging by a chain from his neck. In winter, he obtains from the peasants the requisite supply of sledges and horses; and when the ice-road is broken up, he takes boats, sometimes, to ascend the Lena. But the current of this river is, in general, too strong to allow of a quick conveyance by water, and the post-bags must then be carried on pack-horses, not without danger, along the rocky and rugged banks of the river. Travellers, too, in summer, may take their choice of these two modes of proceeding, for all the Russian postmasters at the several stages, are bound to keep boats and steersmen, as well as horses. Down the stream the navigation is very easy; but, on the return from Yakutsk to Irkutsk, it depends on the condition of the oxen and horses which tow the boat.

At Toyon aruin, there are still perpendicular cliffs of reddish limestone, on the left side of the valley. Here the horizontal stratification is visible on the lower half, while, on the upper half, it is concealed, or its place is taken by vertical fracture. Then comes level land on both sides of the Lena, the declivities of the isolated hills which interrupt it being covered with earth. Dwarf willows now overspread the banks and islands, which are formed of the stones heaped together and the mud deposited on them.

Here in the lowlands were again seen, in great numbers, the separate yurts of the Yakuts; and cattle seemed to be in great abundance. All the sledges are drawn by oxen, the driver always riding on one of them; but they can dispense with the vehicle, and we now met with many men and women riding on oxen. The trot of these animals was so lively and constant, that one could not help soon forgetting the European prejudice against the use of horned cattle for such purposes. I now observed, for the first time,

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that the Ostyaks place in the cartilage of the ox's nose a ring, to which they fasten a rein; the rider holds the end of this rein, and pulls it against the horn, on one side or the other, to turn the animal.

The Yakuts living in the 62d degree of latitude, have far more trouble in keeping their cattle, than any other people devoted to the same kind of husbandry. They make long journeys to collect hay for the winter, yet they do not always find enough of it, but are often obliged to feed their oxen, from March to May, only on the willow and birch twigs, which they procure on the islands in the Lena. The further we examine into particulars, the greater must be our surprise, when we behold here for the first time, a thriving cattle-husbandry in the midst of deep snow and under terrible frosts; we involuntarily ask ourselves, how it came to pass that the Yakuts attached their existence to a domestic animal which is found nowhere else in Asia, under the same circumstances of climate. They have themselves a tradition, that they once brought their herds down the Lena in boats from the sources of the river: but this is assuredly no explanation; it is only a proof that they are themselves sensible of the contrast between the climate they dwell under, and the nature of their domestic animal. I might more reasonably hold the cattle here to be a bequest from a preceding period; that is to say, the remnant of a wild breed, which, in earlier periods of the earth's history, occupied this region in particular. The skulls of wild cattle are found very often in the Lena, and the lakes in the neighbourhood. Living and untamed individuals are to be seen beyond Behring Straits, on the coasts of Hudson's Bay; and doubtless, those dead cattle, as well as these living remnants, all belong to an age of the world, when the northern parts of the earth had a much milder winter than at present. There remained here, instead of the

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long-haired American bison, the scattered bones of that original breed, and, thanks to the care of the Yakuts, their degenerated herds.

In Ulakhansk, sixty-one versts from Toyon aruin, I met in the yard where we alighted a noble chieftain of the Yakuts, who was on his way to a judicial inquiry. He was distinguished from the rest of his countrymen by superior stature, for the Yakuts, though broad shouldered and very strong boned, are collectively not above the middle size. He was also in good case, as befits, according to the ideas of the Yakuts, those who are well off; for their adage says, "To eat much meat and to grow fat upon it, is the highest destiny of men." I admired this man's frock, made of blue cloth with red facings and white metal buttons; it had an old fashioned European look, and was, doubtless, made in imitation of some suit of honour presented to one of his predecessors by the Tsar. He gave me to understand, however, with national pride, that his genuine Yakutian cap was better worth looking at and more valuable also. It was lined with squirrel-skins, and outside was very artificially made up of sable, otter, and black fox furs; it had, moreover, very odd-looking appendages made of the fur of the glutton, which hung down over his back.

This chief's feelings respecting the dignity of his nation, and above all, of his own dignity, displayed themselves throughout all his conversation, which he carried on in broken Russian. Thus, he always named Yakutsk "the city of the Yakuts;" and he congratulated me on my prospect of soon visiting its rich yurts. He told me that the administration of justice, and the general internal management of society among the Yakuts, are still left in their hands. Their immediate chiefs and magistrates are still of their own nation, just as I have already related of the

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Bashkirs. The whole race has been divided, from time immemorial, into certain tribes; each of which is again distributed into Ulúsi, or communes. The heads of the latter are chosen by the Yakuts, from the chief families for life. They are called Toyoni; which the Russians very properly translate by Knyás or prince. But it is extremely unbecoming, on the other hand, to put these nobles and other heads of tribes on an equal footing with the mayor of a Russian village, and so entitle them merely *gólova!* These principal dignitaries remain in office only three years; the Yakuts always choose them from the number of their acknowledged princes, and they are therefore not inferior, certainly, to a Russian governor; and, particularly, because the charge of public administration among the Yakuts is defrayed by that people themselves. When he and other Toyoni required cattle on the road for an official journey, they levied them not on the Russians, but on their own people. He assured me that the writing of the Buraets was quite unknown here, and that before the arrival of the Russians the people had no idea of written characters. Consequently, all written communications to the Yakuts are made in the Russian language and writing.

I remained in Taboga, thirty-three versts from Ulakhansk, and twenty-three versts from Yakutsk, till daybreak, that I might see and salute from a distance the goal and object of my journey for the present; my Kosak also wanted rest. He was suffering from a fever, which he had evidently contracted by fasting obstinately during the fatigues of a journey. It was in vain that he took, on this occasion, great doses of sal ammoniac, which, like all Siberians, he carried with him.

April 8. — We proceeded in the morning, with a bright sun, through a tract of remarkable appearance.

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The Lena was now divided into a number of arms, and between the ice of these lay islands, with snow heaped high above, while their sides, from fifteen to twenty feet high, were quite black. These islands consist of fine mud with heaps of willow stems and roots swept together by the stream; but the unparallelled frost which their naked sides have to endure every year had cracked them vertically, and divided them into such rude pillars that they reminded one of the limestone rocks of the upper valley. The narrow clefts were filled from above with ice, which now looked like shining veins in a black rock. Here, too, there are willows on the banks of the Lena, and birches and poplars form a thick grove at a little distance from the river.

The numerous riders, male and female, upon oxen, and the frequent Yakutian sledges met with, announced the vicinity of the capital; we saw its towers soon after from a distance of ten versts, and drove from the ice of the left arm of the river to the northern and more elevated bank.

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CHAP. XV.

YAKUTSK. — YURTS MINGLED WITH HOUSES. — THE MAGNETIC POLE. — TERRESTRIAL HEAT AND MAGNETISM CONNECTED. — EXTREME COLD. — DEPTH OF THE FROZEN GROUND. — CHANGES OF TEMPERATURE. — THE SUMMER. — PRECAUTIONS. — POPULATION. — YAKUTIAN SETTLERS. — EXTENSIVE TRAFFIC. — NEW SIBERIA. — FOSSIL IVORY. — FOSSIL WOOD. — MANNERS IN YAKUTSK. — OLD FASHIONS. — COMMUNICATION WITH OKHOTSK. — CENSUS ON THE LENA. — HISTORY OF BESTUJEV. — MEN OF GENIUS IMPLICATED. — MANNERS OF THE YAKUTS. — THEIR FOOD. — LANGUAGE.

April 8 to 22. — On the plain, north of the Lena, a churchyard marked the commencement of the town; the black earth of some ready-made graves was there distinguishable in the deep snow, together with the points of some wooden crosses, and a little chapel in the midst of them. Then we came to homesteads standing alone and separated from the larger half of the place by a broad hollow now completely covered with snow. In spring it joins the water of the river with a lake lying to the west, and possibly it once served as a protection from the hostile Yakuts. A wooden fort with four half-sunk towers, and fragments of the old palisading, which the Russian conquerors constructed, stand at the further side of the trench along with the great stone-built cathedral, and another church, dedicated to that great worker of miracles, St. Nicholas. The streets succeeding are the most singular that I have ever seen in Siberia, for between structures of European aspect stand the winter yurts of the northern nomades, with their walls of cow-dung, earthen roofs, doors covered with hairy hides, and windows of ice; and among these yurts again, are the frames of the conical summer tents.

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The bright snow only is spread uniformly over all this, and after a little time there is perceived one pervading design among the heterogeneous elements. The Russian houses are placed forwards to the street, often at considerable distances asunder, but connected in that case by boarded fences, which surround their yards. These extend back to a good distance from the street, and it is in them that the yurts of the Yakuts are seen intermingled with modern buildings, like remains of the original vegetation allowed to stand in cultivated grounds.

A lodging was assigned to us by the authorities of the town, in a house situate in the principal street, very comfortable and convenient, and belonging to the son of a Boyar. The great stone market place close by, reminded us completely of European towns; but behind, in the yard, which I chose for the magnetical observations, the ancient, indigenous customs were still to be seen among the inhabitants of the surrounding yurts, and others of the same nation who came to visit them from the forests of the east.

The magnetical results of the last journey were now examined more narrowly, and it was clear that we had, in fact, crossed the meridian of the Siberian magnetic pole between Irkutsk and Yakutsk. The magnetic attraction of the earth was decidedly greater between Kirensk and Beresovoi Ostrov than at any other point which we had visited, in the same parallel of latitude to the east or west. The pole sought for had there exhibited its greatest force, and extended its influence furthest to the south; and, consequently, we must have been there on the same meridian with it. This probably took place at Parshinsk, in longitude 111°·27 E. In Beresovoi Ostrov, indeed, in long. 117°·32 E., I found the magnetic force somewhat greater; but this observation was certainly irregular, for, before we arrived there, in Kantinsk and Yer-

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binsk, there was already a perceptible decrease in comparison with Parshinsk. Similar consequences followed from the observed series of directions of the horizontal needle. In the vicinity of a centre of forces, these lie, almost exactly, in plains passing through that point and the centre of the earth. But now from the places between Irkutsk and Yakutsk, I found them directed to a point in long. 112°·25 E., and lat. 82°·5 N.

Furthermore, the connection between the magnetical conditions of a place and those of its warmth, received a striking confirmation, for here we were at once close upon the meridian of one of the magnetic poles, and also upon that of the greatest cold felt in any part of the world; or, in other words, we were close to one of the poles of thermal climate.

Yakutsk lies about two degrees further south than Drontheim in Norway, and about the same distance more south than Beresov on the Obi. Those places therefore are much more sparingly irradiated with the sun's beams than the country here, and yet they enjoy an incomparably milder climate than that of Yakutsk. I was here assured on all sides that frozen earth is found near the surface at every season of the year, and that the same condition of the ground continues to the greatest depth hitherto reached. There was now before my eyes an experiment on a large scale, and quite conclusive, in confirmation of this statement.

M. Shergin, who is here the head of the establishment belonging to the American Trade-Company, had much desired to have a well within his enclosure, while the other inhabitants of Yakutsk supply themselves with water in summer from the Lena, and in winter by melting snow. He was, at the same time, quite convinced of the perpetual congelation of the ground, but still hoped to succeed, if the wells

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could be only dug as deep as they usually are in the governments of Vladimir and Nijnei Novgorod. The work was begun at the beginning of last summer, and continued without interruption to a depth of forty-two feet. But at that time,—the warmest part of the year,—the strata of fine sand and clays which formed the sides of the shaft were found to be uniformly frozen hard, so that, instead of digging with the spade, it was necessary to have recourse to the miner's pickaxe. The flakes and frozen pieces of earth in the interior of the well seemed perfectly dry, and they had to be carried up into the warm air and thawed before they gave any signs of moisture. They had now been working again at the well for some days, and an excellent opportunity was thus presented of determining the temperature of the ground for Yakutsk. For this purpose I paid M. Shergin a visit on the 13th April, and descended into the well by means of the windlass erected over it. The workmen employed in it had added two feet to the depth of the shaft that very morning, and about six feet during the immediately preceding days, so that the bottom just broken up was fifty feet below the surface, and six feet under the timber framing of the shaft, which ended with the work of the preceding summer. I there buried the bulb of a thermometer at different places in the ground at the bottom, but never saw the mercury in it rise above —6° R. Consequently it is a decided winter temperature which prevails here in the ground at a depth where no change takes place, and even supposing that the increase of heat, from the surface to the centre of the earth, is as rapid here as in other places, yet even so we could not expect to find water in the fluid state till we arrive at the depth of 630 feet; for to that depth the ground is frozen.

The inhabitants of the Swiss Alps would not un-

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justly think themselves lost if they were compelled to live at the height of 10,000 feet, or 2300 feet above the hospice of the great St. Bernard, and there to support and to clothe themselves by keeping cattle, and with the productions of the surrounding mountains; yet they would then, and not until they arrived at that height, be settled on ground having the same temperature which I found here among the Yakuts, who are rich in cattle. It would seem, therefore, as if that succeeded in Siberia which was impossible in Europe, if we did not take into account that the same constant temperature of the ground may be made up at different places of very different elements. This important fact is proved in the completest manner by daily observations of the warmth of the air which I made in Yakutsk, and from which it followed that the change, too, of temperature is far greater here than it is anywhere under European meridians. Two sagacious merchants living here, M. Katakazia and M. Nevierov, had, for many years, made observations of temperature independent of one another, and they were induced to do so by the striking singularity of the climate of Yakutsk. I determined the corrections of the spirit thermometers which they had made use of, and then obtained from their observations the following remarkable results:—

In perfect agreement with the constant temperature of the ground which I had found in M. Shergin's well, it followed from these observations that the mean temperature of the air, too, is here nearly 6° R. below the freezing point. A degree of cold exceeding —40° R. takes place in Yakutsk every year, between the 17th December and the 18th February, and most frequently in the first three weeks of January. Thus, for example, on the 30th and 31st January, 1827, the thermometer was constantly between —43°·6 and —39°·5; in 1828, from the 1st to the 10th January,

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it was constantly, and without exception, under 40° of Reaumur's scale, and fell lowest on the morning of January 4th, when it was —44°·5 R. During the week immediately succeeding, the spirit in the thermometer was always below —35° R., and then, on the 18th January it sank again to —42°·5, and on the 25th to —43°·6 R. In the present year (1829), the cold was somewhat severer; on the 4th and 5th of January, it was —42°·5 and —43°·6, and on the 25th of the same month reached its maximum with —46°·4. All bodies, then, in the open air, were in the same condition to which small masses only are reduced, and not without much trouble, in our laboratories, by mixing snow with crystals of chloride of lime. The greatest cold which has been produced hitherto by artificial means, is —54° R., or only eight degrees below the temperature of the air in Yakutsk.

These extremes of cold are by no means anomalies, which take place for a short time, brought about by winds or other sudden circumstances. In ordinary years the mean temperature of two entire months is under —32° R., so that mercury is in this place a solid body for one-sixth of the year. Even in the latitude of 75°, in the Atlantic Ocean, Captain Parry found the coldest month much warmer than it is here in Yakutsk, in latitude 62°.

An exceedingly warm summer is joined to this cold winter by equable and rapid transitions. Yet now, in the middle of April, I still observed at times, in the morning, temperatures of —18° and —20° R., but the mean heat of the day was already —6° R., and occasionally, for a short time, it thawed in the shade. This ordinarily takes place, for the first time, on the 1st April. The last night-frost follows the first thaw with unusual speed, for it occurs about the 12th May. Summer then continues without interruption till the 17th September, when the first frost of autumn

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changes the colour of the birch leaves. Equally rapid, then, is the passage to the following winter, for thirty days after the first frost, or on the 17th October, it ceases to thaw, and unabating frost takes possession of the remainder of the year.*

Thus there are, in Yakutsk, 128 days in the year without frost, and, during these, vegetable life continues, not merely uninjured, but favoured in the highest degree by the equable and very rapid increase of heat. In the mountains and the northern countries of Europe, the cultivation of corn does not cease so long as none of the three summer months has a temperature less than +7° R. But, in Yakutsk, the mean warmth of June, July, and August, is represented by +11°, +15°, and +13° respectively, and the thermometer is often seen to ascend, in the shade, above +20° R. This happened, in 1827, on forty-four different days. † The benefits which man, his industry, and domestic economy may derive from this powerful action of the sun are not overlooked. Several kinds of grain, and, among others, summer wheat and rye, are sown by the Russians in the neighbourhood of the towns. Their fields are at that time thawed to a depth of three feet; they rest on perpetually frozen strata, yet they produce fifteen-fold, on an average, and, in particular cases, forty-fold. M. Amvrossov, the protopope, or chief priest of Yakutsk, assured me that the cultivation of grain might be here carried much further if there were only more of the Yakuts reclaimed from the nomadic life. It would appear as if the soil here owed its fertility

* The Lena is not perfectly free from ice till about the 25th May. It is frozen over generally on the 2d November.

† A striking contrast to this is to be found in the climate of Spitzbergen, for, although the temperature of the ground is there, according to Scoresby, nearly the same which I found in Yakutsk, yet the mean temperature of the warmest month does not rise above +2°·3 R., or it remains 12° lower than in Yakutsk.

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in some measure to its original constitution, for it has evidently been deposited by flood; partly, also, to the cracking occasioned by the frost, and to the water which, in spring, trickles over the surface, as it finds no passage below where the ground is frozen. In the gardens of the town are grown potatoes, cabbage, turnips, and radishes; gherkins, too, are reared in hot-beds; still more important are the grasses which feed the cattle of the Yakuts, and the noble larch forests east of the town, in which are found the fur animals, as well as timber for building, and fuel in abundance.

In Europe it may possibly be thought strange, that here these extremes of cold are never spoken of as a grievance; but, after residing a little in Siberia, one ceases to be surprised at this. A man clothed in Ostyak furs, may sleep at night in an open sledge when the mercury freezes in the thermometer; and wrapped up in his pelisse he can lie, without inconvenience, on the snow, under a thin tent, when the temperature of the air is —28° R. After this, it may easily be believed that, even with the air at —40° R., nothing more is necessary for comfort, than what every one here possesses, namely, good fur garments for use in the open air, and plenty of firewood for the house. A more careful arrangement of the window, is almost the only particular, among the numerous precautions for guarding against the cold, which distinguishes Yakutsk from other places in Siberia. The window plates of ice in the winter yurts of the indigenous inhabitants, which are rendered perfectly air-tight by pouring water on them, which freezes all round, are deemed the best; but they are not available in the Russian houses on account of the greater height and width of the windows; and in these, therefore, there are substituted for them, in winter, two kinds of window shutters. One kind is used after sunset, and completely covers the whole window; the other,

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which is set up in the day, is of the same size, but has in the middle an opening of about half a square foot, in which is a pane of glass or mica. In some houses, the practice now is to have two panes, the thickness of the shutter asunder, on this small and only passage for light in the winter apartment. Both these kinds of shutter are fixed from within or in the room, and have nothing to do with the *stavni*, as they are called, or outside shutters, which are to be seen here, as every where else, in Russian houses. All these contrivances, moreover, show that the disadvantage of transparent walls in rooms intended to retain warmth, while surrounded with a cold medium, is fully understood in Yakutsk: and, indeed, in very hot rooms, the windows of which are in contact with air at —45° R., every one must soon become aware of the loss of heat by radiation, and must see the necessity of confining the heat by means of absorbing and non-conducting bodies. When the winter's days are but five hours long, the scanty light which the sun still affords, is willingly sacrificed to the much more important consideration of warmth.

Most of the merchants of Yakutsk are worthy descendants of the adventurers and Kosaks who conquered this country nearly two centuries ago. They are fond of relating many traditions, containing fable as well as truth, respecting the events of that time; partly because the solitude in which they live is favourable to the preservation of such traditions, and partly because the local interests and relations have remained just as they were in those old times. A burgher of Yakutsk described to me, as if he had seen it himself, how the four wooden towers and palisades were constructed by the Kosaks who first ventured from Yeniseisk into this country. The Yakuts granted them so much land, for the erection of a fortress, as they could encompass with a few cow-

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hides; and they, shrewdly cutting the hides into very thin thongs, surrounded with them, and took possession of, the whole site of the town. Peltry was at that time so cheap among the Yakuts, and European articles were in such demand, that the natives used to pay for an iron pot as many sables as it could hold.

I have since discovered that the inhabitants of Yakutsk told the same stories to their historian Müller, ninety years ago; but he was in doubt whether the first statement owed its origin to something which actually took place, or was only copied from the exactly similar tale about the foundation of Carthage. In either case, it contains the moral maxim, that in Yakutsk all advantage is to be expected from skill and prudence in dealing with the indigenous population; and this is, at present, the leading rule with merchants and Kosaks. At first I was surprised when I heard my host and his family speaking Yakutian among themselves, as they were proud of their pure Russian descent; but found the same custom prevailing in the houses of all the merchants.

They grow accustomed to that language in the course of their journeys over tracts in which the Yakuts predominate and where these people still preserve that agreeableness of disposition which is the characteristic of their race. By judicious treatment they may be gained over and made extremely serviceable; but to effect this, the possession of their language is requisite above all things. Hence, it was, that in Yakutsk I was earnestly advised, by all the natives of the place, to provide myself, for my journey to Okhotsk, with an attendant who could speak Yakutian fluently, and was well acquainted with the customs of the country. To show the necessity of so doing, several examples were cited of Europeans, who, without such a precaution, travelled with only Yakutian guides, who abandoned them in the

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middle of the forests, taking offence at their behaviour, perhaps through misconception. Under these circumstances, the Yakuts settled in the town are of essential importance to the general welfare. They receive from the merchants, on whose ground they erect their yurts and summer tents, flour, bread, and several other articles of Russian produce, and pay in return either by a certain stipulated service, or else they bind themselves to a kind of vassalage for a longer time. They are the merchants' herdsmen and grooms, and are particularly expert in many little arts connected with the (here all important) business of travelling. To effect the carriage of goods, or forward mercantile despatches, contracts are always made with some of the Yakuts of the town. These furnish the requisite number of horses and oxen from their own droves and herds, or with the help of their countrymen whom they meet on the way. They then go forth as carriers and servants; sometimes along with the traders who load the caravans, sometimes beforehand and alone, to the place of its destination. Russians are never sent from Yakutsk to the east or north. In the neighbourhood of the town, all loads are borne by Yakutian oxen, for greater distances by Yakutian horses; in certain quarters and seasons, rein-deer also are employed to bear loads, and dogs to draw the nart.

With such assistance, and through their own energy, the burghers of Yakutsk have been able to give great magnitude and extent to their travelling and trading operations. They send every year caravans with Chinese and European goods, brought to them from Irkutsk by the boats on the Lena, over the mountains to Okhotsk; and collect, besides, the produce of the whole line of coast on the Polar Sea, between the parallels of 70° and 76°, from the mouth of the Lena to the furthest point inhabited by the Chúk-

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chi; nay, at times, they say, from beyond Behring's Straits and from the mainland of America. For this end, many of them have agents residing in Nijnei Koluimsk and in Ustyansk, whom they supply with goods for bartering. Others go themselves to these places, and hold markets with the Russians settled there and Yukagirs, as well as with the Chúkchi from the east. Skíns of the pesètz, or polar fox, form there, as at Obdorsk, the fixed basis of the trade. These animals are taken in traps set by the Russians and Yukagirs on the tundras or moss wastes along the coast; often in series of such length, that the hunters of Ustyansk have to travel above 300 miles eastwards, towards the mouth of the Indigirka, to the last of their traps.

The Yukagirs and Chúkchi bring also to these markets the skins of the wild rein-deer, which they kill in summer. Great herds of these shy animals break forth every year, about the breeding time, out of the forests in the south, and migrate, with unrestrainable haste, in a straight line to the naked plains near the sea. Thus the Samoyedes at the Obi told me, that the rein-deer there choose, for their summer pasture, the snowy valleys in the mountains of Obdorsk, where we, however, in winter could find only traces of their former presence. In both places it is maintained, that these flights of the deer are occasioned by gnats, which then infest the woods; and I have seen in Kamchatka, under perfectly similar circumstances, reason to admit the likelihood of this account.

Many of the Chúckchi, at the fair of Nijnei Koluimsk, relate that they, with others of their tribe, have crossed from East Cape to America, by the Gvòsdev rocks in Behring's Straits, and have brought back furs with them from thence. They tell the names of many places on the shores of the other continent, and their intercourse with the Americans is the more cre-

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dible, as the language of the Chúckchi at East Cape is found to be connected with that of the Aleutes at Kadjak. The merchants of Yakutsk believe such expeditions across the Northern Sea to be quite easy, and customary, for they themselves personally undertake, or cause to be executed, every year numerous journeys of the same kind, and of much greater extent than a trip across Behring's Straits. They have, for example, explored in this manner, in the first place, the great tracts of land before the mouth of the Lena, in the Polar Sea, adjoining Siberia; they have discovered the islands of Kotélnoi, Phadéyevski, and New Siberia, which are 150 miles distant from the nearest coasts, and have taken possession of them for the purposes of their trade.* Trading journeys of this remarkable kind seem to have been first made about the year 1760, by the merchant Liàkhov. He continued repeating them with increased success, and for forty years had no rival in this kind of mercantile activity but in the Suirovatski family established in Yakutsk. He was followed by Protodiakonov, who discovered New Siberia, and who first announced to the government, in 1806, the existence of these northern islands.

The monopoly which the discoverer had been able to secure up to that time was done away with, and since then resolute men have been found among the traders here, and in Ustyansk, who travel to those islands every year. They generally go with dog-sledges, but at times with Yakut horses, also upon the ice; and find for the first, and more usual mode of travelling, ten weeks quite sufficient—from March to the end of May. In winter some difficulty is created

* The passage of the Chúkchi, across Behring's Straits, is a distance of but fifty-two geographical miles from the one continent to the other, and never exceeds 250 miles, even if they visit the Gvòsdev islands between North Cape and the coasts of America.

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by the darkness of this region; and the traders assert, also, that from the rigour of the frost, the snow acquires a peculiar hardness and sharpness. When this takes place, the friction of the sledge is so great that it can hardly be drawn by four times as many dogs as are required at the favourable season. M. Hedenstrom, who has made several journeys of this sort on the Polar Sea, with as much sagacity as hearty inclination, fully confirms this remarkable fact, and the travellers' difficulty, therefore, cannot be explained by the tiring of the dogs. About the beginning of June, when, between the mainland and the islands, the sun, even at midnight, is six degrees above the horizon, the thaw obstructs sledge-driving as much as the excessive frost in January, although the underlying ice on the sea is even then perfectly safe. In most years it is broken up for a few weeks in August.

Journeys with dogs to the islands, where one must remain months together far from every human habitation, have this additional inconvenience, that it is necessary to have a large quantity of dry herrings to feed the animals. Some narts are sent forward with this part of the lading, about half way, and then return to the coast, after depositing at different places on the ice the necessary supplies. The travellers also reckon on meeting with white bears, of which they kill a few on every journey to the sea, and let the dogs feast on their flesh.

The chase of the polar fox is also carried on successfully on these islands. But still more precious and more remarkable is the ivory, which there, in conjunction with skulls and entire skeletons of elephants, rhinoceroses, bisons, and other extinct species, fills mysteriously the strata of the frozen soil.

This is one of those phenomena which were formerly thought to be confined to a narrow locality,

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but are now found recurring in all parts of the globe. The attempt to explain them, however, is not thereby rendered more easy, for the explanation must apply equally to the coasts of the Polar Sea, the region of the Ohio, and, besides, to all the valleys in the plains of Europe, Northern Asia, and America, with hardly any exception. Yet the repositories found here of the bones of these antediluvian animals, present to view so many incontrovertible proofs of their origin, that they seem to deserve especial mention.

The ground in Yakutsk, the internal constitution of which was learned in sinking M. Shergin's well, consists, to the depth of at least 100 feet, of strata of loam, fine sand, and magnetic sand.* They have been deposited from waters which at one time, and it may be presumed suddenly, overflowed the whole country as far as the Polar Sea. In these deepest strata are found twigs, rocks, and leaves of trees of the birch and willow kinds; and even the most unbiassed observers would at once explain this condition of the soil by comparing it to the annual formation of new banks and islands by the floods of the Lena at the present time: for these consist of similar muddy deposits and the spoils of willow banks, but they lie about 110 feet higher than the ground which was covered by those ancient floods. Everywhere throughout these immense alluvial deposits, are now lying the bones of antediluvian quadrupeds along with vegetable remains. In the lower valley of the Lena, at the place where the Vilui disembogues into that river, between the rocky hills which confine the course of the Yana, and at the Icy Sea, at both sides of the mouths of this river, are found the teeth and bones of mammoths, rhinoceroses, and other quadrupeds, and even whole carcases.

* This was the depth reached in 1831.

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It cannot escape notice that, as we go nearer to the coast, the deposits of wood below the earth, and also the deposit of bones which accompanies the wood, increase in extent and frequency. Here, beneath the soil of Yakutsk, the trunks of birch trees lie scattered only singly; but, on the other hand, they form such great and well stored strata, under the tundras between the Yana and the Indigirka, that the Yukagirs there never think of using any other fuel than fossil wood. They obtain it on the shores of lakes, which are continually throwing up trunks of trees from the bottom. In the same proportion the search for ivory grows continually more certain and productive, from the banks of the lakes in the interior to the hills along the coast of the Icy Sea.

Both these kindred phenomena attain the greatest extent and importance at the furthest chain of the islands above mentioned, which are separated from the coast of the mainland by a strait about 150 miles wide, of very moderate depth. Thus, in New Siberia, on the declivities facing the south, lie hills 250 or 300 feet high, formed of drift wood; the ancient origin of which, as well as of the fossil wood in the tundras, anterior to the history of the earth in its present state, strikes at once even the most uneducated hunters. They call both sorts of trees *adamovchina*, or adamitic things. Other hills on the same island, and on Kotélnoi, which lies further to the west, are heaped up to an equal height with skeletons of pachyderms, bisons, &c., which are cemented together by frozen sand as well as by strata and veins of ice. It is only in the lower strata of the New-Siberian wood-hills that the trunks have that position which they would assume in swimming or sinking undisturbed. On the summit of the hills they lie flung upon one another in the wildest disorder, forced upright in spite of gravitation, and with their

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tops broken off or crushed, as if they had been thrown with great violence from the south on a bank, and there heaped up. Now a smooth sea covering the tops of these hills on the islands would, even with the present form of the interjacent ground, extend to Yakutsk, which is but 270 feet above the sea. But before the latest deposits of mud and sand had settled down, and had raised the ground more than 100 feet, the surface of such a sea as we have supposed would have reached much further up, even to the cliffs in the valley of the Lena. So it is clear that at the time when the elephants and trunks of trees were heaped up together, one flood extended from the centre of the continent to the furthest barrier existing in the sea as it now is. That flood may have poured down from the higher mountains through the rocky valleys. The animals and trees which it carried off from above could sink but slowly in the muddy and rapid waves, but must have been thrown upon the older parts of Kotélnoi and New Siberia in the greatest number and with the greatest force, because these islands opposed the last bar to the diffusion of the waters.*

The mammoths' teeth which had been collected in the preceding years, were already sent to Europe, and I found in the possession of the merchants only objects found incidentally with the fossil ivory, and brought from the same place; among these were the crania of a species of ox, and rhinoceros' horns, the latter much too large to have belonged to any living species. One of these horns, which I took with me, is bent back almost in a circle. It has, at the root, a diameter of eight inches in the direction of the nose, and of two-and-half inches perpendicular to

* The Ammonites which the ivory-finders bring from the Kotélnoi Islands, prove that a part of this chain consists of rocks of much more ancient date than the alluvial deposits containing bones.

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that, and is formed, like whalebone or Spanish cane, of filaments or thick hairs, lying parallel to each other, and easily separable. These are externally triangular, and have a cylindrical canal within. When first taken out of the ground, they have a dull and woody look; but in water they become bright and translucent, and the smell of horn which they give out when burnt, reveals their true nature. From the roots to the points of these horns may be remarked, at regular distances, several very strange-looking rings, within which the fibres are bent in a waving line, and seem to be more loosely united. These evidently mark the limits of so many periods of growth; for it may be seen that, in conformity with this assumption, the distance between the rings regularly diminishes from the point of the horn to the root, as the diameter of the horn increases. The several portions, therefore, lying between the rings, have nearly equal contents. This is true chiefly of those parts which have grown during the latter half of the animal's life; the uppermost growths, which are referable to the earliest period of life, contain much less. It appears, then, that thermal years, or periodic changes of a like kind in the conditions of animal life, existed at that time. This inference from observation is interesting, inasmuch as other geological facts seem to show, that at a still earlier period the effect of the sun, on places differing in geographical position, was either nearly equal, or else the differences in this particular were compensated and rendered unimportant by the more perfect communication of heat from the centre to the surface of the earth.* The rhinoceros, the horn of which I obtained, had lived twenty such periods.

* A greater equality of all climates may be conceived also as the result of a more perfect transparency of the æther. As less heat would be then lost in the process of transmission, the relative effects of the fixed stars would be increased, and the mean temperatures of the pole and the equator would be more nearly equal.

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Thin plates cut from these horns, are elastic in the highest degree. They are, therefore, sought for eagerly by the Yukagirs, and, like cow's horns among the Buraets, and resinous wood among the Ostyaks, are used to line the bows. The attention of the people is therefore turned upon this memorial of the antediluvian world, more than upon any other; and the nomade geologists at the Icy Sea, have arrived at the conclusion that these horns are the talons or claws of gigantic birds, which were more ancient than the Yukagir tribe, and in former times fought with the latter for the possession of the tundras. I have already alluded to the way in which this mythus of Northern Asia appears to have been transformed into the Greek fable of the Grifons. It is now propagated as credulously here in Yakutsk, as it formerly was by Aristeas and Herodotus. When I told them of the rhinoceros, they said that they had often heard all about it, but that they always called the horns in question birds' claws, and saw no reason to change their custom.

Neither did I find among the dealers in fossil ivory, any hypothesis respecting the other antediluvian remains, which might be advantageously added to our European systems. They praise only the wisdom of the Creator, who supplied with fossil ivory all the markets which are deficient in walrus teeth. In fact, the walruses keep at a great distance from all the shores of the Icy Sea; and yet, at the same time, their teeth bear an important part in the trade of Archangel. They are brought to that port from the Pechora, among other places; but further east they are never met with. In Obdorsk, in Turukhansk, Koluimsk, and Ustyansk, the mammoth's teeth take place,—in commerce,—of those of the walrus; but the latter again resume their importance in the domestic economy and trade of the Chúkchi, and the tribes inhabiting the north-eastern part of Kamchatka.

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Notwithstanding this want of learned hypotheses, there is much interest felt here in scientific pursuits, provided that they promise to be of use to the traveller and the trader. I was often pressed to sell the telescope which was attached to my circle; for, on the journeys to the ice and the islands, small telescopes are always used, and deposits of ivory in the plain are often discovered from a great distance by the projection above ground of a single tusk.

I found the domestic manners of the old families in Yakutsk quite as entertaining and agreeable as their conversation about their travels. Tea-drinking at the evening parties is here carried as far as it can go. Five or six cups are usually taken as a matter of course, and then another at the earnest entreaty of the lady of the house. The lady, in pressing her guests, ascends through all the ordinary phrases, till she comes at last to the singular expressions *ponatújtes* and *ponevolites;* that is, make the endeavour, and get the better of your reluctance. At the same time, great quantities of the cedar-nuts are eaten, to which they often give the whimsical appellation of *rosgovorki*, chats or conversations. For here it is expected that young ladies, in the company of elderly people, will hold their tongues. They sit, in their fine dresses, along the side of the rooms only as ornaments and for show, and, to give their mouths employment, they are allowed nuts instead of conversation. And in truth these nuts give the mouth sufficient occupation, for it requires no little skill to pick out the seeds; so that, to the unpractised, they seem better fitted for squirrels than for men.

After tea we were treated, as is customary in China and in all the towns of Siberia, with *varenie;* that is, preserved fruits from Little Russia, and with dried apricots from Bokhara. Here was added also a most savoury and true Yakutskian product, which I was

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surprised to find was raw flesh. Large slices of beef are hung up in autumn on wooden trestles made for the purpose, and then are left for the whole winter in some airy place, exposed to the action of sun and frost. They are fit for use at the beginning of spring. It is impossible to guess, from the appearance of this article, what it is: for the whole is then perfectly dry; the fat has a waxy look, and is as white as snow; while the lean is a hard, cellular mass, with a whitish hue, where cut. Whenever it is wanted for use, these slices are cut into very thin strips, which have so agreeable a flavour, that we cannot help admitting that the frost and the open air are sufficient substitutes for the culinary art. I found the Siberian product far better adapted for eating raw, than the *carne secco* in California and Brazil, which is dried merely by the heat of the sun. The meat dried in this way in Yakutsk, keeps in summer quite unchanged. It is an inestimable resource for travellers, who are not always in a position to make a fire for cooking; and by long use, one grows so partial to this invigorating food, that even at home, as at these tea parties, it is eaten as a dainty.

The house furniture and clothing of these families of the old stamp, have probably undergone little change for the last 200 years. Some young ladies, perhaps, begin to cut their gowns, of Chinese materials, after the European fashion; but with women of mature years, the sarafan and silk handkerchief over the head, are still the full dress. It is not want of example, but merely religious attachment to the past, which thus maintains the sway of old fashions; for trade, and the storms of politics, conduct, from time to time, new people into Siberia, and bring about, even in Yakutsk, many unexpected contacts. Thus I met in Yakutsk with a Greek merchant, M. Katakazia, who told me much respecting the Island of

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Ulysses, and who quoted, in narrating his own adventures, the verses of Homer. He had fled into Russia, very recently, from the oppression of Turkey, and had now settled here for the sake of the fur trade. He lived with European elegance, and, although to procure a few paintings, a piano-forte, and some other things, he had to send to Moscow, 5000 miles distant, yet there was nothing in this calculated to deter Siberians from following his example.

As to the American Trade-Company, the factory at Yakutsk is one of the most important, for here where the sledge roads terminate, there is need of clever management to forward at once safely and cheerfully the grain and various other European merchandise destined for the Aleutian islands. Carriers also go annually from this place to Okhotsk, with Yakutian horses, to receive the skins of sea cats and otters, which arrive there in the vessels from Sitkha. In Okhotsk, the small peltry which is used for bartering with the Chinese in Kiakhta, is separated from the more valuable furs which are sent direct to Makàriev. Thus Yakutsk exercises a considerable influence on the maritime trade, although it is separated from the coast by a tract, 580 miles wide, of very difficult country. This state of its relations was particularly apparent at the time we speak of. The port of Okhotsk, which has hitherto afforded the only communication between the insular colony and the continent, has been long since found to be inconvenient and unsafe, and a proposal for a new one had originated in Yakutsk. Some people from the factory here had actually just ridden, straight through the forest, to the mouth of the river Ud, in lat 55°, five degrees south of Okhotsk, and fifty miles from the Japanese boundaries; and had sent a messenger here to announce that the bay was as good as had been expected. It contained only a single sandbank, and not an entire bar,

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as in the roadstead of Okhotsk. All was now activity in the house of M. Shergin to promote this undertaking. I found there a number of Yakuts, scraping and cutting ox hides; for the people sent to Udskoi wanted leathern boats, which were to be sent to them from this place, for sounding the bay.

In such affairs, and, indeed, in most others, the American Company stand quite independent of the governor of the province. This officer, however, in the case of Yakutsk, is now always selected from the imperial navy, but only because the administration of this province, even with reference to the commerce, involves in many ways the control of the port of Okhotsk. The imperial ships, which, as well as those of the Company, navigate the sea of Penjinsk, and cruise on the coasts of Kamchatka, have to be supplied from Yakutsk with provisions, often even with hands to man them; and, besides, the various journeys and expeditions over the tundras, and other trackless wilds of this province, could not, doubtless, be directed by any one better than by a seaman, if the practical faculty of the Yakuts and Kosaks in this department required any assistance. Captain Myágkov, the governor of Yakutsk when I was there, enjoyed the good will of all, because he knew how to reconcile the interests of the indigenous population with those of the Russian Siberians. I have often dined at his table with rich Yakutian herdsmen, who reckoned on his hospitality whenever they left their yurts to visit the town. They were as little acquainted with the language and the manners of St. Petersburg as their fellow-countrymen on the Upper Lena, or the Ostyak chieftains; but the governor was not in the least ruffled by their addressing him with "thou" and "right honourable sir," alternately: and, indeed, every one here is accustomed to give way to their proud and somewhat surly self-confidence. M. Myàg-

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kov took care to return these visits; and he made, at the time when I was in Yakutsk, a journey of some extent to the yurt of a Yakutian knyásetz or prince, who had invited him as a witness to his son's marriage, or rather to the payment of the koluim on that occasion.

I have already mentioned a census of the indigenous population, which had been made the preceding year in the northern part of the government of Tobolsk. A similar work was now going forward in Eastern Siberia, and I met in Yakutsk with three excellent men who were employed in its execution. Of these, M. Pyatuitki alone was connected with the finance department in St. Petersburg, while MM. Tásken and Slòbin, from the mines of Nerchinsk, were associated with him, in order to afford him the opportunity of becoming acquainted with whatever mineral riches might exist in the tracts of country gone over. The main object of the expedition was to make a new assessment of the yasak or fur tribute for the several families and tribes of the indigenous population; and we were told that they were instructed by the government to deal with the people in the mildest possible manner. Yet they had been able to increase the yasak everywhere throughout the tracts occupied by the Yakuts and Tunguzes along the Upper Lena, as the number of inhabitants had increased there considerably during the last fifty years. It is said that the same result is obtained for all Siberia taken together, and that exceptions are to be found only in localities where endemic diseases prevail, as in the case of the Verkhovian Ostyaks. I heard on this occasion of a particular kind of numerical notation, invented during the present intercourse with the aborignal tribes, and in which the new assessments were expressed and enjoined to the several communities, and the old accounts settled. It con-

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sisted of only six different figures, which represented furs to the value of 5 and 10 kopeks, and of 1, 10, 100, and 1000 roobles respectively. When the amount of the assessment was agreed on, it was written in these runes on paper, and then cut on wooden staves as permanent memorials, as the Ostyaks and Votyaks are accustomed to do in their private transactions. To the inhabitants of remote and secluded yurts this was obviously an event of great importance, and worthy to form an epoch in their history. The Yakuts celebrated it in extemporaneous songs, of which a Russian interpreter preserved this fragment: "The commission erected its throne with us for the good of all; receive it well, ye other tribes, that ye also may be dealt with wisely."

One evening as a number of Yakuts were looking on at my astronomical observations, I was surprised at hearing in the dark some words of French, and some one expressing his fear that 'we would not recognise Bestujev;' I replied to his doubt with a Kosak adage, that "mountains stand still, but men must associate together;" and I congratulated myself on the prospect of a stirring conversation in my lonely abode. Hard-heartedness and stoical indifference are all that could be expected of a man who had awakened all at once from dreams of liberty to chains and a dungeon; and who, after long expecting an ignominious death, had accepted exile as a favour. Such a man, nevertheless, had here preserved, in features, language, and demeanour, all the freshness of youth and the brilliancy of great talent. He confessed to me that the cheerfulness of his disposition constantly revived in him against his will, for the weight of the past and a hopeless future were enough to weigh him down, yet he was attached to the present, and had spirit to enjoy it.

Alexander Bestújev had been engaged in the con-

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spiracy long before the outbreak of the revolution. Convinced of the ability of the Russian people, he had given ear to those who were for raising it on a sudden from servitude to a free constitution. This was the only object meditated or talked of by them when they resolved on extreme measures, and they hoped to get the better subsequently of some of their associates who were strongly suspected of selfish ambition. Of the troops whom they reckoned on seducing, they found on the 14th of December only 5000 men at their disposal, though they had calculated on double the number; yet they had, to some extent, taken the feelings of the soldiery by surprise.

This was the case when Lieutenant Alexander Bestújev, who was at that time adjutant of the corps of engineers, and as such not attached to any regiment, was sent by the conspirators, on the morning of the insurrection, to the barracks of the regiment of Moscow. By passionate representations only, such as suggested themselves at the moment, he inflamed the spirits of the men. Not one of the officers took part in the movement, and yet five companies supplied themselves with flints and cartridges from the magazine of the barracks. They marched, ready for action, in order of battle, and with flying colours, to the parade on Isaac's Place, the orator only, who had hit on true Russian phrases, at their head. Yet nearly all of them saw him then for the first time, and, besides, he wore a uniform different from theirs.

It is well known how the Emperor on that occasion, with a chivalrous contempt of death, awakened repentance in the more respectable of the insurgents, and subdued the multitude. All felt as if proscribed by the moral power of the victory. There was here no ground for thinking of mercy, and yet hardly one availed himself of the opportunities for flight, which offered on every side at the first moments of the in-

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surrection. Even Bestújev was left unpursued during the course of the day, but at night he returned from a secluded quarter where he had concealed himself, and went, unrecognised, through the posts of the artillery, who were stationed at their guns, by watch-fires, with lighted matches. He went to the Emperor's palace, where one of his friends who was commanding the body-guard, received him with horror. The fetters which he afterwards bore in the citadel at St. Petersburg and in one of the fortresses of Finland, nay, the death of his friends who fell by his side, under the hands of the executioner, on the scaffold, had never been able to efface from the exile's memory that one passage in the first night of his sufferings. He could not even to-day relate without shuddering how the Emperor came up to him in a large and very dark room of the palace, and with insupportable haughtiness of look, told him of the loyalty of the deceased General Bestújev and the degeneracy of his son.*

A fatal bond connects this political drama with the most beautiful production of Russian poetry. It is already known in history, that the Emperor Alexander was induced by devotees, in 1822 and 1823, to oppose checks to that intellectual development which he had himself previously fostered and promoted in the noblest manner. It was then that he first engendered alienation, in some measure by the increased strictness of the censorship; but as this excited during the succeeding years a dangerous opposition, and as it itself created the necessity for its continuance, it proved abortive to an unexampled and scarcely credible degree. It could not be overlooked that it was to the malcontents and conspirators, that the poetic

* Alex. Alexandrovich Bestujev, known as the author of several works on military education.

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laurels in Russia at that time properly belonged, and the main drift of their inspirations was to spread their own enthusiasm. "To the friends of our native country" were dedicated, in the same manner, and as if by concert, the "Poetic Spring-gifts" of Bestújev Riúmin, two years before his execution; the "Recollections of Holland" by Nikolai Bestújev, an elder brother (now also banished) of him who is in Yakutsk; and the "Mnemosyne" of the conspirators Küchelbecker and Knias Odoyevski. Neither of these productions, nor the similar literary works of Muraviev Apostol and others of these ringleaders, justify in any degree the title of "a sedition of prætorians and populace" with which that Russian disturbance has been designated in Europe.

But the poems of Ruiléyev and of Alexander Bestújev appear still more decidedly to have been not so much the consequence of a noble public spirit crushed at its first opening, as the tragic harbingers of the calamities about to ensue. They worked together for three years as editors of a literary journal, called the "Polar Star," with captivating grace in the track of freedom, until Ruiléyev snatched for himself alone the gloomily bright crown of a prophet and unchanging friend. I allude to his poem of Voinaròvski, which has sprung from the deepest feelings of a noble spirit. The origin of this piece can be explained only by supposing that, for some months before the poet's death, he knew, either from the sagacity of a sensitive and excited temper, or from a secret foreboding, how the threads of that web were to run, which he was assisting in the dark to weave. He beholds in spirit the dreams of the conspirators at an end, their plans wholly frustrated, their views stigmatised, his friend Bestújev expelled from society; he discerns beforehand every fine line and touch in the sufferings of years, and finally, he sees himself in the

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hands of the executioner. Yet he goes onward in the path in which he believes himself to be impelled by destiny, with manly composure, therefore he conducts the desperate business to an end, and takes on the battle-field the post at which he was to forfeit his life. But whether it was for the sake of the last enjoyment of his melancholy, or from unconscious impulse, or the wish to show what he was, he first clothed his tragical apprehensions in deathless words.

Mazeppa's insurrection, the banishment of his accomplice Voinaròvski to Yakutsk where the historian Müller met him in 1736, when he was become half savage, presented a resemblance which seemed more than accidental. Bestújev received in the prophetic poem the name of his predecessor in banishment, but at the same time every single feature of him was preserved with terrible fidelity. The poet paints Yakutsk, which he had never seen, and the life of the exile there, with so much truth, that it is impossible to think over his verses without shuddering at the reality. And must I add, too, that an allusion to our meeting to-day was written three years ago!* His friend's fate was next his heart, and Ruiléyev there-

* This circumstance, which I mentioned on my return to M. von Chamisso, occasioned his translating the verses of Ruiléyev (Adalb. von Chamisso's Werke, Leipzig, 1836, bd. iv. p. 51., &c.). The original edition of the Russian poem contains many historical particulars respecting the chief parties mentioned in it. We find that Andreas Voinaròvski, the nephew and accomplice of the Russian Wallenstein, for so Mazeppa may be named, made himself known in Germany in his day. He fled after the defeat of Charles XII. and the insurgents of Little Russia at Pultawa, and lived for some years under the protection of the court of Austria. The Countess of Koningsmark, the favourite of Augustus, King of Poland, and mother of the famous Count Maurice of Saxony, is said to have given her heart to the bold and accomplished fugitive. Voinaròvski was arrested in 1716, on his way through Hamburgh, by the Russian envoy in that place, and sent to St. Petersburg. By the prayers of the Empress, the sentence of death which hung over him, was changed into banishment for life. After twenty years of exile, when he met with the historian Müller, he retained only faint traces of the manners of civilised society.

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fore left his own image in the back ground; yet he often gives vent to the feeling of a conspirator who knows his ignominious end and yet goes onwards. Thus he paints the horror with which Mazeppa thinks of his being stigmatized as a traitor after his death, and, in conformity with Russian usage, cursed in all the churches. In the dedicatory verses he bids farewell to the friend who alone attached him to life. He takes leave of him with the sentence, "I am not a poet, but a citizen."* The last of these words was then used for the first time in Russia in this sense, and by a man, too, who atoned for so doing with his life. But who will, on that account, doubt that it will, some time or other, become current even there?

The chief outlines of this truly historical poem are so striking, that many of the incidental circumstances, though remarkable in themselves, lose nearly all their interest. Ruiyélev's verses were prohibited for some time after his execution, but previous to that they were printed and circulated without interference. The allusion to a future revolution, and the apotheosis of a past one, were thought, in Russia, to lose all offensiveness as soon as the editor was pleased to say in some notes, "Mazeppa's character was not so noble, in reality, as it appears in poetry; the revolutionary maxims which he and Voinaròvski utter are more worthy of a rebel than a good subject;" and some things of the same kind, which would now be looked upon as nothing more than irony, aimed at the weakness of a censorship affecting to be all powerful.

Here, too, Bestúyev gained the affections of all, without intending it, by the vivacity of his spirit, by the vigour and agreeableness of his countenance and figure. In the governor's house, every one lamented

* Ya ni poet, a grajdanìn. The old Russian language has no word which comes nearer in sense to citizen than *grajdanin*, that is, the inhabitant of a place which is fenced or walled in.

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that they could see there but seldom the most engaging of the inhabitants of Yakutsk; and the Siberians and Yakuts, who heed but little what happens in Europe, made no scruple about showing their liking for their new fellow-townsman. They cheerfully lent him horses to hunt, or to ride to neighbouring yurts in the forest, for here, where any flight would only place him in worse circumstances than he is at present, freedom of this kind is not forbidden to the exile.

Bestúyev had lost, a few weeks before, a companion in misfortune in that pardoned exile whom I met in Irkutsk. He now succeeded to the latter's share of the hut which they had inhabited in common, and had furnished with a singular mixture of Yakutian utensils and sundry remnants of European property. Among the latter were some books which he was allowed to send for, and one of these was Goëthe's "Faust," the first copy, doubtless, of that work ever seen in a place which is as cold as the north pole. The now solitary exile sought comfort in observing all the remarkable features of the country around him. He had described in drawings and in words many customs of the Yakuts, and he thought of devoting the rest of his life to the study of their language and the ethnographical questions connected therewith. As we were bidding a mutual farewell, each told the other what he expected from the future, and promised to communicate information respecting any failures that might take place in these predictions. Fortunately it was Bestúyev who was first called on to fulfil his promise, for instead of finding a grave in Yakutsk, as he expected, he received his pardon the following year.*

* He described in his letter to me the joy he felt as he rode, through snow, water, and flooded rivers, from the Lena to Georgia, where he was to recommence his career under the Russian standard as a private soldier.

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I have still to offer, as the results of my residence in this capital, some general remarks on the Yakuts, for this will render more easily intelligible the details of what I saw in the yurts along the valley of the Lena, and on my subsequent journey to Okhotsk.

For winter travelling, the Yakuts, like the Ostyaks and Samoyedes, wear a fur frock, with the hair outside. Even here this outer garment is generally made of rein-deer skins, yet the poorer people use for the same purpose the skins of slaughtered horses and oxen. To this garment is always given the form befitting the saddle, which I have mentioned before. It is trimmed round the edges with black furs, and is ornamented on the back with elaborate figures, in the same material. It is called sanayakh, a name given also to the over-coat of the women, which is, indeed, distinguished from that of the men only by its greater length; it is cut up behind, and adapted for riding, just like the other. During the milder part of the year, and for a long stay in the house, a garment of the same shape as the sanayakh, but made of extremely pliant leather, dyed yellow, is substituted for it. Yet it is not uncommon to find in the yurts men and women with the upper part of the body naked, when they return from the open air to the fire, or have just got up from their sleeping benches, for the cloaks are worn immediately next the breast. Both sexes wear, moreover, on the lower part of the body, drawers of pliant rein-deer skin, which, like those of the Ostyaks, reach from the loins to the middle of the thigh; leggings, which are fastened to the lower end of the drawers, and waterproof boots. This last, and most excellent part of their dress, is called *eterbàs*, from which name the Russians here, who decidedly, and justly, prefer the Yakutian boots to European shoeing of any kind, have made *torbasà*. They fit everywhere close to the leg, and cover it from the

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sole of the foot to far above the knee; at the same time, owing to their perfect pliability, they are as convenient for pedestrians as for horsemen. That they may be at once flexible and waterproof, the torbasàs are always cut of thin horse-skin; which is steeped, in the first place, in sour milk, and smoked, and then rubbed well with fat and fine soot from the chimneys. The sole, also, is made of the same kind of leather; the seams are sewed inside, and towards the toe there is a point turned upwards, just as in the boots of the Bashkirs at the present day, and in those of Russian horsemen in the sixteenth century. But, on the other hand, these boots are without the high heels which make the walk of the Bashkir and Kirgiz so awkward and ungainly. Two long strings of leather are sewed to the torbasas at the bottom, to be fastened tight round the leg, first at the ancle, and then, when they have been brought behind the calf, again under the knee, where their ends are tied together.

The Yakuts use, besides, for protection against the cold, a broad and serpentine tippet (in their language, *moitruk*), of black squirrel tails, gloves of fox fur (*utélek*), and a cap (*bergésa*) of striped cloth, which covers the forehead and part of the face, with a bordering of glutton skin. I have observed with some Yakutian girls, a kind of leathern cushion, which they wore under the sanayakh and over the drawers. The object of this was, probably, to mitigate the hardships of riding on oxen; perhaps, too, it might be compared with a somewhat similar piece of dress worn by the Chuvashian women.

No less peculiar is the food of these people; they all prefer horse flesh to beef, but are so careful of their cattle, that none but the richest slaughter any regularly, the rest only on festivals and special occasions. At wedding feasts all the guests are treated with

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beef, and the bride serves up to her future lord a boiled horse's head, garnished with a kind of sausage made of horse flesh. Far more important to the majority of the Yakuts is the milk of their cows and mares. In summer they have the greatest abundance of it, and then they use it unmixed in making many dishes. For winter they keep a stock of milk in vessels of birch bark, and with a certain quantity of it, thinned with water, and some vegetable substances, they make their daily porridge. It is only in the neighbourhood of the Russians that they can procure flour for this purpose; in the remoter yurts, the under bark of the fir and larch supplies the ordinary material of bread. This is pounded in a mortar, made, like the walls of the yurts themselves, of cowdung laid on basket work, and frozen hard. In June and July, when the mares foal, the Yakuts show themselves as skilful as the Bashkirs, Buraets, and other Siberian tribes in the art of setting mare's milk into the vinous fermentation. They then celebrate a religious thanksgiving and festival, at which the men empty off, at a single draught, immense wooden goblets of these intoxicating drinks. The women are, on these occasions, obliged to content themselves with the intoxication of tobacco fumes. There are some, also, who distil the sour milk, as is done by the Buraets, in an iron kettle; which, in order to collect the vapours driven off, is covered with a board, and provided with a wooden tube passing under water. The Yakutian name, *aruigui*, designates both this national spirit and Russian brandy. Another oily kind of drink, made of milk, is used in winter; the Yakuts call it *arui*, but the Russians, in plain terms, melted Yakutian butter; and this, too, is capable of intoxicating if it be taken in sufficient quantity. Besides these, all kinds of fish and animals of the forest are eaten by the Yakuts, without scruple, and without

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much delicacy of selection. The branch of this nation which is cut off from the rest, near the shores of the Icy Sea, are able to conform to necessity, and to subsist entirely on this kind of food, for the keeping of rein-deer, which enriches the Tunguzes in that quarter, has never succeeded with the Yakuts.

Although the Yakuts are considerably inferior in civilisation to the Buddhistic Buraets, yet they possess, in many respects, extraordinary cleverness and knowledge. They have the appearance, rather, of a people who have grown wild, than of a thoroughly and originally rude race. Their skilful management of the deer skin, and their expertness in ornamental sewing, are conspicuous in every article of their clothing, and in many details of Yakutian housekeeping, to be mentioned hereafter. They seem, in many cases, to have in view, not merely the satisfaction of their wants, but decoration also, and pleasing appearance. Yet, while pronouncing this opinion, it is necessary that we should look fairly at the kind of life led by these herdsmen; and, having done so, we cannot feel surprised that everything belonging to them smells of cowdung, and that their clothes, which are never washed, very soon take the look and colour of the substance with which they are in perpetual contact. Some productions of Yakutian industry are purchased by the Russians, and sent into Europe, particularly floor-cloths of white and coloured felts, which are cut into narrow pieces, and then tastefully and symmetrically sewed together, like mosaic. It is a still weightier circumstance that these people have been able, from the earliest times, to procure themselves certain metals, and have known how to work them. The iron ore of Vilui is smelted and wrought in the yurts at that place, just in the same manner as at Tashkent, or as among the Buraets and the Tatars of Kusnetsk. Long before the Russians came here, the other tribes

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of Yakuts got from those at Vilui iron axes, awls, and tools for stripping and dressing the hides; together with copper ornaments for their clothes and harness, and the metal plates which they, like the Ostyaks, sew on their girdles. But even now, when they make use of European guns, every man among them still exercises the skill peculiar to the nation, in making the great knife, or dagger, which is carried under the sanayakh at the waistband. The Yakutian steel is easily distinguished from the Russian, by its being somewhat flexible; and yet, blades made of it will cut copper and pewter as easily as the best European blades. The wooden handle of the knife is always ornamented, after the original fashion, with tin work; from which it is evident that they procured the materials from Nerchinsk, before the Russians knew anything of the metals in that quarter. They cut figures in the wood, and cast the tin into the hollow; a large knob of the metal, left at the top of the knife-handle, is then shaped with the chisel. The sheaths of these Yakutian daggers are made of birch bark, and covered with black leather, on which, again, are metal mountings, with straight-lined patterns engraved on them. I had occasion, once before, to mention some decisive proofs of the influence which the Siberians of the furthest north exercised on the civilisations of the Yakuts. Here, on the other hand, certain handicrafts, characteristic of nomadic life, and, above all, the art of working metals, evidently point to a connection with the tribes at present inhabiting the southern steppes and mountains. The physical character, also, and language of the Yakuts decide in favour of the same view.

Their yellow complexion, the sharp lines of their faces, which express indolent and amiable gentleness rather than vigour and passion, their pitch-black hair, also, which the men wear cut close, all reminded me

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of the Tatars of Western Siberia. The Yakutian women look much more lively and cheerful than the men; they are often very beautifully formed, have regular features and sparkling black eyes; yet these attractions are seen only with the younger of them, their faces, which are not round, but oval, and somewhat lean, being, like those of the Tatar women, disfigured by wrinkles at an early age.

It cannot by any means be maintained, that the Yakuts have received the better part of their civilisation, at some time or other, from Mongolian neighbours; their names for the Deity, for iron, and the other metals, (excepting the tin of the Buraets), for their fishing gear, &c. are all pure Turkish. They call the intoxicating and distilled drinks made from milk, by the same names as the Turkish Tatars. The Yakutian term *aruigui*, which is the name for brandy, common to all the Turks, from which also is derived our European word arrak, is used also, indeed, by the Buraets, and some other Mongolian tribes; but yet it seems to be, in its origin, the property of the Turkish race, with whom it does not stand isolated, but in connection with the names of other kindred objects. This is the case with the Yakuts, with whom the word *aruigui*, or milk brandy, is a modification of, or is derived from, *arui*, cow-butter.

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CHAP. XVI.

TALENTS OF THE YAKUTS. — ILL EFFECTS OF INTERCOURSE WITH THE RUSSIANS. — THE JOURNEY TO OKHOTSK. — PREPARATIONS MADE. — PROVISIONS. — DEPARTURE. — WINTER DWELLINGS OF THE YAKUTS. — SINGULAR SUPERSTITION. — SACRIFICES. — KOSAK INTRACTABILITY. — AMGINSK. — OBSTRUCTIONS MET WITH. — THE RIVER AMGA. — NOKHINSK. — ERRORS OF THE MAPS. — THE RIVER ALDAN. — FINE VIEW OF THE MOUNTAINS. — THE SETTLERS AT THE FERRY. — ENDEMIC DISEASE.

THE teachers in the schools in Yakutsk, informed me that in their Yakutian scholars was to be remarked a singular aptitude for mechanical arts; but that, on the other hand, it was vain to think of teaching them arithmetic, or any such logical acquirements. Other Russians, who were as well acquainted with the language of the Yakuts as with their own, told me that the songs of those people often contain very remarkable passages of a character which we should call romantic. Thus, they assume that "the trees of the forest hold discourse with one another; and other inanimate things with men." These poetic fantasies, pass away, for the most part, just as they arise, for whether on a journey, or in cheerful humour at home, every one sings the new impressions made on him at the moment, by the objects around him. They have for that purpose a kind of song consisting of only two notes; these are repeated frequently in such a way that the higher note follows the lower till towards the end of each part or verse, when their order is reversed. The whole air sounds so melancholy, that I often thought that I heard some one in the town

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wailing aloud, when, in fact, it was only the extemporaneous song of the Yakuts. It is not unlikely that my occupations have lived for the moment in Yakutian verses. The men inhabiting the yurts near our residence, used to come every night to the yard, to observe the use made of the transit instrument, and they soon made up their minds as to its purpose. They were of opinion that I was reckoning the stars, and wrote down each of them in the account; that in fact, a star had been lost in St. Petersburg, and I had been sent to try whether it could be found again in any part of the earth. This story spread through the town, in the first instance, so generally, that even Russians asked me whether it was well founded; it then made its way over the country, even as far as the Tunguzes.

In the neighbourhood of the Russians, the original good nature of the Yakuts has been adulterated with a great deal of vanity, and some covetousness. Crimes, though still rare among them, are no longer quite unheard of. When I was staying in the town, a man was murdered in the street, while returning to a yurt in the neighbourhood. Another Yakut came forward to say that he had found the dead body, but the day after he confessed that he was the murderer, and that his sole object was to get the dead man's money.

By the 20th of *April*, I had determined the geographical position of the four church towers in Yakutsk, and had completed a series of observations on the periodical variations of the magnetic declination; the levelling of the valley of the Lena, too, was brought to a conclusion, by the arrival of Lieutenant Due, and a further comparison of our barometers. Nothing now remained for me, therefore, but to think seriously of departing. But winter still reigned here far more completely than it had done in Irkutsk four weeks before; yet, as I was now about to recede from the

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meridian of cold, and might expect to meet with a milder climate towards the sea coast, I could not help feeling some apprehensions about the breaking up of the roads, which takes place here at the beginning of spring.

Journeys from Yakutsk to Okhotsk are very rarely undertaken in winter by private individuals; the only communication then between those places is by post. I was advised, therefore, on all sides, to stay here in Yakutsk till June or July, when it becomes possible to ride to Okhotsk all the way on horseback. For this purpose, the merchants send forward horses to stations of their own along the road, or they hire or buy horses for the occasion, to carry provisions and goods to that furthest outpost of the empire. In winter, on the other hand, horses are employed for only 390 versts of the road; Tunguzian rein-deer and dogs for the remainder. The interest which I felt in this kind of travelling, and my desire to be acquainted with the nomadic tribes who make use of it, but who in summer keep at a distance from the Russian road, confirmed me completely in my original determination; besides, I was afraid that if I staid in Yakutsk, as I was advised to do, I should lose all chance of getting a passage by sea to Kamchatka.

Although the first 250 versts were to be travelled in little sledges, yet it was necessary to pack all our baggage with a view to its further carriage on horses, and for that purpose to make it into small bales or parcels in pairs, matching as closely as possible in weight and bulk. The merchants here use for this end, thin wooden boxes, which are nailed tight, and then sewn over with ox-hide. It would thus be necessary for me to take leave of all my property for a month; but as I wanted most of the instruments for daily use during the journey, I resolved to get some cases made which might be easily opened, and to provide for them as

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much protection as possible against water, in case of wading through rivers, or of thaw in snowy weather. But this proposal, again, like everything new, met with great opposition; it was executed, nevertheless, after the rejection of some miscalculated attempts; for the Russian carpenter made the cases to fit on horses, and never thought of the rein-deer, which require much smaller packages. When the carpenter's work was finished, three Yakutian women were called in to cover the boxes with ox-hide, for these people alone understand the operation, of which, indeed, they seem to have been the inventors. The hides are steeped in water, then wrapped round the packages when wet, and sewed tight with thin leathern thongs. The packages thus covered must be dried in the oven before they are carried on a journey, and then they close so tightly that no water can penetrate, even through the seams. The thin boxes are at the same time strengthened so as to bear to be knocked about. The Yakutian women went to work most vigorously, but stopped several times to stimulate or intoxicate themselves, with the fumes of tobacco. I gave them some of my European tobacco, but they pronounced it weak, that is, not sufficiently narcotic, and returned to the unmitigated Circassian leaf.

It is also the custom here for travellers to provide their own supplies of provisions. Russian *Christian* stomachs find little on the road that suits them, at least during the fasts; and indeed any one would run the risk of starving, in case of losing his way, or meeting with delays on the road, if he trusted to any other resources than his own. The provisions which he takes must unite two conditions; they must occupy as little space as possible, and must bear keeping.

On these accounts, a decided preference is given to what is called *sukhari*, that is, bread cut into cubical pieces about an inch high, dried till it is quite hard,

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at a moderate fire, and contracted as much as possible. In general, travellers spend some days, before they leave Yakutsk, in preparing this kind of biscuit. It can, however, be had ready made, by the pood, from the merchants, although somewhat dearer, and of two kinds; namely, the *chernoi sukhar*, or black biscuit, made from rye bread, and the *bieloi sukhar*, or white bread, which is only used at tea. The name of this article, it must be observed, has no connection with sugar, (in Russian, *sákhar*), but is derived from *súshiti*, to dry. A sufficient stock was laid in also of the dried meat, which I have already spoken of. Towards the close of the winter, all the Yakutsk families have a great stock of it; and just now there was to be seen over the ridge of every Russian roof, a pole, on which these pieces of meat were hanging as a very original kind of ornament. These provisions, along with Yakutsk butter, and peas, and buckwheat groats, imported from Irkutsk, were then distributed into several pairs of leathern bags. These bags, made by the Yakuts, and alone used here by the Russians, are called súmui. They are made of horse-leather, with the hair stripped off. The side thus stripped is turned outwards, and from its smoothness, and whitish hue, it closely resembles parchment. The súmui most carefully made, are those used for carrying flour from this to Okhotsk and Kamchatka. They are cylinders only three or four inches high, and about a foot and a half in diameter, joined by a scarcely visible seam inside, and filled through a small opening in the side. On the journey, they lie with the flat surface against the animal's flanks. Finally, a *chainik*, or tea-kettle, and a copper cooking-vessel are deemed indispensable for the nomadic life; both of these, however, I possessed since my journey to the Icy Sea.

All these preparations were complete by the morning of the 22d April. I received the necessary post-

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order, and a young Kosak, named Fedor Revyákin, who was to accompany me as Yakutian interpreter, had reported himself ready. But still there occurred a vexatious delay, for Mitléyev, all of a sudden, and with every kind of objection, made difficulties about attending me further. At last he discovered that the instructions of the governor-general were no longer sufficient, but that he ought to have the written order of the governor of this province. But M. Myágkov had gone that very day on an excursion into the country, and it was not till his return, at ten o'clock at night, that the business was settled to my satisfaction. Had my eyes been opened at that time to the Russian's fanaticism and inflexibility, I should have seen, in the difficulties raised by him, indications of an unfaithfulness which was, in fact, of long standing, and, unchristian foreigner as I was, I should never have thought of constraining his will; but I treated him as one to whom I was attached, and in whom I reposed entire confidence, and so I never rested till, about one in the morning, I was on the way to Okhotsk, not only with Revyákin, but with Mitléyev also.

April 23.—I had at last got about midnight the necessary post-horses, and, after some altercation, three weak sledges also, which we were to take with us to the beginning of the horse road. They wanted at first to put us off with two of these vehicles; but, for use in the forests, they are built so small, that we could hardly find room in three of them for ourselves and our baggage. The snow had already melted in the streets of Yakutsk during the last few days; I found it necessary, therefore, to get all our luggage packed on oxen before our door, and carried to the bank of the Lena. There it was stowed, with much trouble, in the sledges, two of which I entrusted to the superintendence of the Kosaks. The borders of the river are here quite flat,

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and the icy surface, four versts wide, on which we travelled, could hardly be distinguished from the plain on the right bank. On this, we first met with some Yakutian yurts, with German names! They are called *yàrmonskiya*, that is, the yurts of the yearly market (*jahrmarktliche*) or fair, because the Russian merchants meet here in summer, and begin their journey to Okhotsk by bartering with the Yakuts of the neighbourhood. We then came to a thick wood of larch trees, and in this crossed a wooden bridge over the Tera, an affluent of the Lena, which has cut its bed deep in the soft soil. Shortly after one of our sledges broke, and no sooner was it tied together, than there arose a new cause of delay. Mitléyev had shut up my dog in our house, and had forgotten him there, as he pretended. I had to send back the Yakutsk Kosak, therefore, to loose the dog, while we, about daybreak, continued our journey very slowly. Deep snow had here effaced every trace of the road, even between the trees, and it was not till noon, therefore, and eleven hours after our first starting, that we reached Talbuiyakhtàtsk, a stage only twenty-eight versts from Yakutsk. There, in a cleared spot of the wood, stand four winter yurts; close by are some paddocks fenced in, to keep the cattle together in summer, and the frame of a tent, which is likewise used only in the warm season. It is formed of a number of poles, about twenty feet long, which are united at the top into a roomy cone. The Russians call these summer abodes of the Yakuts, *beróstinui*, from *beresa*, the birch, because they are covered with the bark of this tree. Here the people were, in fact, repairing a roof of this kind. It was made of quadrangular pieces of bright yellow and perfectly flexible bark, which was not merely joined together, but was very handsomely worked along the seam with horse-hair thread.

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From Talbuiyakhtàtsk, we again went on through a hilly country, covered with a thick forest of larch. The hollows alone are without trees of the pine kind, and are accordingly turned to account by the Yakuts, as meadows, or for gathering birch and willow twigs for the cattle. In hollows of this kind, lie the yurts of Tegulinsk and of Chasnigyisk, the former of which we reached about seven in the evening, and the latter at midnight. Here, too, the winter habitations have ice windows, the log walls are caulked, as it were, with cow-dung, and flanked with walls of earth to the height of the windows. The flat roof is covered over with earth, and on the east side prolonged with boards over the door. Horsemen, arriving at the house, tie their horses to the posts supporting this projection. The winter cow-house is under the same roof with the yurt. It is always larger than this, but has much thinner walls. The life led in these yurts is very comfortable, although a stranger in them would suppose, from the smell, that he was in a cow-house. There is at all times a blazing fire in the hearth, which is made of beaten earth, and upright logs of larch wood throw out, with a peculiar crackling, showers of sparks to the roof. There were always some calves in the yurt, tied to the posts near the fire, while the cows cast a contented look through the open cow-house door, at the back of the fire-place. There, too, are the sleeping-places of the people, which, in the poorer yurts, are made only by a continuation of the straw from the cow-house. During the evening, all the inmates of the yurt, men and women, sit round the fire on low stools, and smoke, with their little pipes, a mixture of wood shavings and tobacco.

April 24. — From Chasnigyisk, we proceeded on our journey as early as one in the morning, and yet it was midnight by the time we got over 100 versts.

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This last Siberian journey with horses, had no longer anything of the Russian character. Here, for the first time, there were no bells on the shafts-bow, and instead of the spirited calling, with which the yamshchiks incite their horses, there was nothing heard but the Yakut driver's droning song. He goes on at a slow pace, and alights from the sledge from time to time to smoke his pipe. He then cuts from the pole of the carriage the requisite quantity of shavings, and empties his pipe, swallowing the smoke at the same time, before he thinks of setting the horses again into brisk motion.

At the yurts of Porotovsk, 109 versts from Yakutsk, I made at noon magnetical and astronomical observations, and here already I found the Russian maps erring considerably in the position of places with respect to Yakutsk; we then went over thickly wooded hills to Churopchinsk, and thence to Aruilákhinsk, where we stayed till morning. In the woods between these places I remarked, for the first time, a singular custom of the nomadic Yakuts. At different points on the road the trees were to be seen hung thick with horse-hair, and my driver assured me that every horseman who passed by was sure to add more or less to this strange store. Here, also, it was manifest that white horses prevail among the Yakuts; but, apart from this, many of the tufts of hair had so weather beaten an appearance, that there could be no doubt of their antiquity. Others were quite fresh, and had been tied on the boughs but a day or two. Our Yakut attendant said further, in reply to our inquiries — and, indeed, all his answers in similar matters were much to the same effect — that it was done in compliance with ancient custom, and that he knew no other reason for it. Yet the religious bearing of this custom appears at once from its name, which signifies a propitiation for the *Lieshei* or Spirit

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of the Woods, as the Kosaks explain it. All the merchants of Yakutsk deem it expedient to adopt, when travelling, the prevalent belief, and to satisfy its demands at the cost of their horses' tails. The Yakuts here have clung to several other devout inventions of their shamans. Thus the annual consecration of a horse is usual with them, as with the Western Turkish tribes. They select for this purpose the best stallions, which, after receiving certain benedictions, remain thenceforth exempt from every kind of work. It is possible that they intend thereby to offer a kind of satisfaction to their cattle in general for the labours or violent death awaiting them, yet the shrewd priests have not overlooked the practical advantage of securing good treatment for the fathers of the droves.

Mitléyev's dislike to the present journey rose today into open and very suspicious refractoriness. He demanded, in a violent rage, to be allowed to remain with the Yakuts of Aruilakhinsk because he was sick, and he even threatened me with the sword, when I required that he should at least follow me to the seat of a Russian postmaster. It appeared to me so necessary to maintain discipline in my party, now that we were entering the desert, that I was determined to have my own way. Stubborn as he was he made up his mind to obey, when I reminded him of the consequences of a robber-like attack on one who was now his rightful superior, and told him my determination to take him on in fetters if necessary. I must observe, that the Yakutsk Kosak had advised me in secret to take this course, although in the presence of Metléyev he continued to behave as his friend and comrade. My confidence in this my new follower was, consequently, much weakened, and in the moment of excitement I could not help thinking that he wished, out of mere selfishness, to see our altercation turn to violence, in order that the open fight might

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end in the pillage of my supposed riches. The Yakuts alone listened to our dispute with good-tempered surprise, and their feeling was evidently on the right side. It appeared as if they had never before witnessed such perversity and passionate excitement.

April 25. — We travelled, from midnight to ten o'clock in the evening, seventy-seven versts on ground rising rapidly, yet the places met with lay at elevations of only from 585 to 640 feet above the sea. The yurts of Lebegine and Menjega belong also to cow-keeping Yakuts. These people repeated to us the assurance that they prefer horse-flesh to all other meat, and that from their horned cattle they take for food, only milk and butter. Many here, too, wore pelisses of horse-skin, with the hair turned outwards; the rest, the usual sanayakh or riding coat, which was made of rein-deer leather, dyed of a reddish colour, and trimmed with a blue border at the corners. I observed in these yurts, for the first time, an excellent substitute for our tinder; it is made of the stalks of a kind of grass which grows in dry places. These are dried and beaten in the mortars which the Yakuts employ in preparing the bark meal. By this means the spiral vessels of the grass are separated from the rest, in tough, woolly threads, about a fifth of a line thick. They are then rubbed well with wood-ashes from the hearth, and are thus rendered extremely inflammable. For a long time I used no other than this Yakutian tinder, and if it got damp I renewed it, and made it as susceptible as ever by only rubbing it with larch-ashes. It burned slowly, with an agreeable smell, and was capable of kindling even moist tobacco.

In Lebegine I determined the geographical position of the place at noon, by altitudes of the sun; then with the west wind came a heavy storm of snow, and continued till the evening, when we reached Amginsk,

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on a broad river from which it takes its name. In this place we staid for the night, because here the sledge-road terminates, and the journey with horses could begin only with a new day. The passage of the Amga is, therefore, of great importance to travellers, and some Russians have settled on the spot, and have built a church. They themselves, however, live, like the Yakuts of the place, in very homely yurts. In one of these, which was called the post yurt, we found the supervisor, in official costume, whose duty it was to examine the post passes of travellers, and arrange accordingly on their behalf with the Yakuts. On the sleeping benches of the same yurt, a Russian newly married couple had already taken up their quarters for the night. They came from Okhotsk, where the man had served as clerk in the commissary stores. We stowed ourselves away in the vacant space as well as we could, and had no reason to complain of the cold. The thermometer rose to + 28° R. (95° F.) on the wall that was farthest from the fire.

April 26. — Once more, and as if by way of a farewell from the Russians, I was to be punished for slighting their religious customs! It was Easter Sunday, which, without being aware of it, I here began, like other days, with giving orders for the journey, and in the rude travelling dress. The Kosaks and the Russians settled in the place, on the other hand, had done their best to improve their appearance; and now they began to kiss one another, and to salute with the words *Christos voskrès*, and *vo éstino voskrès* — "Christ is arisen," and "he is in truth arisen." Then came a number of Yakuts into the Russian yurt. They embraced the elder, and, therefore, principal of the believers, with timid reverence, and took great pains to pronounce the salutation correctly. And I, too, came in for a share of the kisses and congratulations, from both Russians and

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Yakuts. Yet I came to my senses too late; the odious remark was already made, that the traveller was a *Nechrist*, or heathen, and, therefore, a *Nyémetz*, or no Russian; for with the common people the two terms are equivalent.* It was then found that the five post-horses, to which I was entitled, did not suffice by any means for the carriage of my things or pack saddles, and that I should have to hire four more in addition.

A Russian farmer was now called, who had settled in Amginsk as podryadchik, to supply the merchants with the means of travelling; and he, after the usual fraternal kisses, was willing to let me have nine horses for the whole journey to Okhotsk, but he would not hire fewer, nor for a part of the way. Of course I must stay here, he observed, till the snow melted, so that I could do without rein-deer and dogs, and reach Okhotsk with horses. I thanked him for his Christian kindness and offers of assistance; and then, after some trouble, obtained from a good-natured Yakut the requisite number of horses as far as Aldan, where I had letters of recommendation to an officer who could make good the defect of my post-pass.

These negotiations being concluded, I assented to the dismissal of the Irkutsk Kosak, for the supervisor of the post, whom I had called in as a kind of mediator and witness in the business, decided that I ought not to prevent a man who was dying from spending Easter in devout rest and in a Russian church. Mitléyev had, in fact, the look of one suffering from fever; and he hurried off immediately to church to the mid-day mass or *obyedna*, and the people of Amginsk congratulated him loudly and ironically on

* It is a common story in Russia, and not incredible, that Russian soldiers imagine that they shall be able to converse with Germans, English, Dutch, &c., if they only go recruiting among the Tatars of Kasan, who, like the preceding, are pagan barbarians.

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his being enabled to join in their festival like a true believer. Yet I could not avoid seeing, under the cover of his illness and his bigotry, a peculiar national mixture of hypocrisy and unquiet conscience, and this view of the case was confirmed in the sequel. On my arrival in Okhotsk I remarked, in the first place, that my stock of tobacco had been pillaged, for of the papers which had contained it some were empty, some were filled with hay, and, from want of sealing wax, had been fastened with fish-glue; and, afterwards, I had also reason to be convinced that a considerable sum of paper money had been stolen in Yakutsk from a desk, the key of which I had several times given to Mitléyev. I see no reason, on deliberate reflection, to doubt that the perpetrator of these thefts was the pious Irkutsk Kosak. He was sure that I should not discover them till my arrival in Okhotsk, as all my things, the instruments excepted, were sewed up in hides, and must remain unopened till the end of the journey; and this circumstance alone explains his determination to leave me, and the increasing desperation with which he effected his purpose.*

In travelling there is nothing more depressing than hindrances which excite malevolence or ill-will. Experience proves the truth of this, even in Russia, where noisy altercations in travelling are properly styled *khlopotá;* and secret intrigues, by which people try to thwart one another, *kryuchki*, or hooks. By way of compensation, however, for such annoyances, there always follows the happy moment, when the traveller released, turns his back on the society of man. The joys of the peaceful wilderness are then

* In Yakutsk, on the 17th March, I had 2370 roobles in bank paper, and in Okhotsk, on the 10th July, I had but 925; my expenditure in the mean time having amounted to 795. There was a deficiency, therefore, of 650 roobles not accounted for.

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doubly felt, and natural difficulties are encountered as if they were amusements. To-day I experienced both kinds of feeling, as about noon all our chests and leathern bags were at last packed on horses, and horses were saddled at the same time for two Yakutian carriers, for myself, and for Revyàkin. The pack-horses were then fastened together by fours, the tail of each being tied to the bridle of the horse that followed; a Yakut placed himself at the head of each set, the Kosak kept the rear, and I, as careful owner, rode sometimes before, sometimes behind the caravan.

The Amga, in the neighbourhood of this place, flows between steep banks, thirty feet in height, which appeared to be composed wholly of soft soil. It has a width of about 3000 feet; but it was at present still so firm, that we rode on it with all our loading. In summer travellers cross it in small boats, their horses swimming beside them. On the other bank, the vicinity of the mountains soon grows apparent. The hills are there more considerable, and more regularly shaped; all the waters, too, flow in deep glens westwards to the valley of the Amga. The whole face of the country seems to be covered with larch-forest, and we rode through it, first on a narrow road like a foot-path, and a little after between two chains of hills, along the level bottom of a valley where the wood was not so thick, and which we followed for fifteen versts to the east. Here the wild animals are without fear of man; for, in broad daylight, a fox, out of curiosity, ran sometimes before, sometimes after the horses, just as dogs do; and then I saw a snow-white hare playing close by our path, quite unscared by our movements. Enormous clustered lichens hung down so thickly here between the boughs of the larches, that no one could regret the missing foliage of these trees. Another agreeable sight was that presented by our horses, going one after another

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in a train, a hundred feet long, and at equal distances. Seen from afar, they looked like a great snake winding through the trees; but then again the equestrian costume of the Yakuts was easily recognised, as well as the singularly shaped loads which hung down on both sides from the pack-horses. Sometimes we were obliged to make circuits to find openings in the wood, so that the horse-loads might pass through without danger of concussion.

The slow and regular pace of the horses was extremely welcome to me, for my chronometer, which was in one of the larger boxes, wrapped in woollen, received thereby a uniform rate, so that the geographical positions could now be determined with less trouble and more certainty. Some of the hardship of this kind of travelling, however, was felt to-day. The temperature was now little below the freezing point, and the snow, which fell in large flakes unceasingly, melted at once on the bodies of the men and horses.

It soon penetrated the clothes which I had put on, experimentally, instead of the Ostyak clothing, as being fitter for riding in. About six o'clock we came to the end of the valley which we had been following hitherto. There the road rose steeply, and continued then, for some versts, at a great height. I rode forward alone, and saw soon after two horsemen approaching in a trot through the dreary forest. They called out from a distance *Christos voskrès!* and announced themselves as the carriers of the Okhotsk post. They, too, had left their pack-horses with Yakuts in the rear.

Being wet through and frozen, I joyfully descried at last a yurt; which, however, on a near inspection, proved to be quite uninhabited. All about it was in decay, and hardly any traces of the flat roof were to be seen beneath the snow. The chimney had no smoke, not a sound was to be heard, and the

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door was covered so completely with snow, that I rode by it three times without observing it. I then knocked to no purpose at the remnants of mica panes, till at last the whole window fell into the yurt. That did the business, for a Yakut opened in a fright the snow-beset doorway, and saluted the Russian horseman (as he deemed me) with a kind of *voskrès!* He then helped me to alight from my horse, and we did our best to kiss each other. He had been previously sleeping very quietly in the dark and cold yurt, but he now went to work to kindle a bright fire on the hearth; and before the rest of my party arrived, I had enjoyed the chief advantages of a hospitable roof. The Yakut knew little more of Russian than I did of his language, and yet, without the aid of an interpreter, we were the best friends possible. He helped me to take off my boots and clothes, showed me how I should dry them, and set a stool for me in the best place before the fire.

This hut, which is named the Yurt of Nokhinsk, was built by the Russians as a shelter for travellers. The man whom we found in it, inhabits it only to keep it provided with a necessary supply of firewood, and for that service he receives flour from the Russian store at Aldan. The light roof adjoining the yurt afforded our horses the necessary protection from the snow, and the company of a lean mare which belonged to our host. They are fed on a journey, at this time of the year, only with willow twigs, because these alone can be gathered without much trouble from the brushwood in the hollows. We took an excellent meal of dried meat, snow-water was poured also on some black biscuit, and set near the fire that it might turn sour. In this way is made a poor kind of substitute for the true kvas. Many of the Russian-Siberians attach such a value to this drink, that they will not go on a journey through deserts with-

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out a good supply of yeast. They then make the infusion of bread-water upon the yeast, in what is called a *búrnya*, that is, a vessel of birch-bark with a double bottom, the lower half of which contains the sour sediment. The hunters and promuishleniks of Vitimsk, who spend some months every year in the most inhospitable wilds, and have a hard life of it, go so far as to maintain that a Russian would inevitably die if he were once without the means of preparing kvas. Yet this belief, as well as that of the indispensableness of salt, which is frequently uttered by devout Russians, evidently rests on religious grounds, and not on experience. They like to distinguish themselves, even in the wilderness, from the pagans surrounding them, by a peculiar mode of living. There was no symptom here of those bad qualities of snow-water, which European travellers in the polar regions have thought that they discovered. During the entire of this journey I drank nothing but melted snow, or tea made with it, and experienced no ill-effects from it. And, moreover, between Yakutsk and Okhotsk, and subsequently during several months in Kamchatka, I ate my food without a grain of salt. Many of the Russian merchants have now accustomed themselves to do the same thing on journeys of this sort; and even my Kosak was able to accommodate himself to the new system, although at first he thought with horror on the want of leaven and of salt, the two most essential elements of true Christian diet.

April 27.—The snow had ceased already by four o'clock in the morning. Then the clouds gradually dispersed, and from six to ten I took altitudes of the sun, and made the usual magnetical observations before the door of the yurt of Nokhinsk. This lies at an elevation of 740 feet above the sea, on a longish plain, surrounded by mountains thickly covered with

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wood, and which rise to a height of 1275 to 1595 feet. This country reminded me forcibly of the woody mountains in the European Alps, and the Yakutian yurts, built with stems of trees, and with loaded roofs, are not unlike the Swiss herdsmens' huts; particularly where they possess large herds, and are surrounded with hurdles and other accompaniments of pastoral husbandry. From the mountain woods around I heard now, for the first time, and as long as I stayed before the yurt of Nokhinsk, the cry of wild animals increased by the echo. It was a hoarse piping or bellowing, abruptly ejaculated, and in a tone that brought to mind the cry of ounces. They were evidently quadrupeds which thus broke the general silence, for the direction of the sound, and the changes it underwent, showed that they were in motion on the ground. I thought at first, but erroneously, that it was a kind of fox; and it was not till I had heard these noises repeatedly for some days, that I discovered the true authors of them.

The yurt of Nokhinsk was placed, on the latest Russian maps, about 0°·63 too far to the east, and 0°·82 too far south, or about fifty-two miles distant from the point where my observations determined it to be. We left the place about eleven in the morning, and we arrived about six in the evening, after a journey of thirty-five versts, at the bank of the river Aldan.

We first went eight versts, on a level tract, to a yurt which stands in the broad valley of a rivulet. It belonged to an aged Yakut who, with a young wife, had a family of five children. His business was fishing in the neighbouring stream; yet here again I found some calves occupying the straw in the narrow dwelling. The children were quite naked, and even the woman, who had slept till near mid-day, had nothing on but her short drawers, and went about with

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the upper part of her body naked all the time that I was in the yurt. In this there was no breach of Yakutian propriety, for women are not forbidden to expose themselves in this manner, except in the presence of their fathers-in-law, or of their husband's elder brother. She was a well-grown woman, with regular, handsome features; but, at the same time, disfigured with filth, like every thing else in this miserable hut. One of the elder children, which was running about with the others, was afflicted with a remarkable and formidable looking eruption. The left side of its body exhibited a wound about an inch wide, which had extended, herpetically, from the head perpendicularly down to the middle of the body. On the parts affected, the upper skin seemed totally destroyed, and instead of it there was only to be seen the blood-red flesh. The parents, when I asked them about this malady, seemed to look upon it as a usual and ordinary matter; and in truth I subsequently saw many cases of it among the Yakuts, but chiefly in children.

I found a larger and more opulent yurt a few versts further on, standing on a well-wooded eminence. Its occupants possessed a good herd of cattle, and hunted, during the winter, after the foxes and squirrels in the vicinity. Our road then again led through thick forests of larch, and a mountainous country. Here trees were frequently met with, hung over with an extraordinary quantity of horse-hair tufts. They always stood at the highest points of steep hills, just as if the horse-hair were offered by way of thanksgiving after a difficult ascent. Besides these traces of Yakutian travellers, I remarked, at the road-side, wooden posts with inscriptions cut on them in the Russian language. These were monuments erected by Kosaks who had conducted in summer the supply of provisions to Okhotsk. The usual form of these

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inscriptions is, "This post was erected by the Kosak N. N., who conducted a caravan in the year . . ." or, "Here the night was spent by the Kosak N. N.," &c. These inscriptions proved, at all events, that tired horsemen had sacrificed some hours of rest at the fire side, in order to leave behind them memorials in a wilderness where there are but few to read them. It is certain, nevertheless, that the very rarity of such monuments in the wild forests lends them a charm, and makes the discovery of them an interesting event. We remarked among these posts one which was dated in 1685, and which may, therefore, be supposed to have survived the erector of it about a century at least.

I again rode forward alone, and came upon a height, the eastern slope of which was clear of wood. With surprise I beheld below a broad hollow encompassing the valley of the Aldan, and beyond it, for the first time, the distant and lofty summits of the Aldan mountains. The landscape was magnificent. The wooded hills beyond the river seemed no higher than the point on which I was standing, and were far outtopped by the broad and glittering chain of mountains which separated us from the ocean. Many of the summits were covered with snow, and they all betrayed the naked rock by the ruggedness of their outlines.

Below, in the plain, these more distant points again disappeared from view. There I rode three or four versts between willow thickets, on a marshy bottom, now frozen hard, and then stopped on a sudden at the steep bank of the Aldan. Here I waited for the rest of the caravan; and saw, on the opposite bank, the first rocky cliffs which had occurred since we left Yakutsk. The termination of their strata is horizontal, and traversed by vertical cracks. I could not, however, examine them more closely, as we rode

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still four versts further down the river before we crossed the ice to the right bank. There we found, on a gentle slope, a wooden magazine, the yurts of the Russian officer, Argunov, who had charge of it, and a large boat frozen fast in the ice. This place is called *Aldanski perevos*, or the ford of the Aldan.

I brought compliments and a letter from Yakutsk to the worthy couple who lived here, the only true believers in the midst of Yakuts. Their manners reminded me forcibly of the tale of Philemon and Baucis; but they manifested, at the same time, that unshakeable belief in the value of a Christian or noble descent, which is generally supposed to exist only among the Spaniards. All the European-Russians who had gone to Okhotsk, or returned thence, within the memory of man, lived here fresh in the recollection of these kind people, as if they were beings of a superior order. The good-natured old pair felt pleasure at the thought that all these worthies had been their guests; and they repeated to me, with a feeling of pride, and as a proof of friendly intimacy, all the names and titles of every official personage whom I should meet with in Okhotsk, Kamchatka, or the American settlements. M. Argunov was of ancient Siberian descent; but his wife boasted to be sprung from a family, branches of which (as might be proved) still dwelt in St. Petersburg. She seemed inclined to entertain her lord pretty often, even in the wilderness, with this inappreciable advantage. He, on the other hand, rested his consequence on a worn out, but strictly official, uniform coat; and he also observed, complacently, that it was "an imperial yurt" which they were living in. It may be easily conceived, that such loyal citizens set a great value on the written letter of recommendation which I had received in St. Petersburg from the highest authorities. M. Argunov, to show his respect for it, and to supply the

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deficiency of my post-pass, gave me an order for three pack-horses, or their equivalent in rein-deer or dog-sledges. He then begged me to allow him to see once more that declaration of the imperial will; "he wished to make a copy of it, for it was really a beautiful piece of writing, and it was but seldom that he had an opportunity of feasting his eyes with so precious a document."

In the evening, the weather being fine, I determined the position of the Aldan ferry, by astronomical observations. The heat of the air had risen in the morning to +3° R., and then, as clouds overspread the sky, continued almost unchanged. But after our arrival in Aldansk, the sky cleared again, and by the rapid radiation of the heat in the transparent atmosphere, the thermometer again sank, about nine o'clock, to —15° R. In latitude and elevation above the sea this place differs little from Yakutsk; but its more eastern position would lead us to expect that it has a milder climate. They told me that, even in the warmest months, under sandy soil, and often at a depth of only six feet, layers of solid and transparent ice are found here, alternating with frozen and dry earth. This is the same phenomenon which I saw near Yakutsk on the banks of the Lena, and which is also found on the islands in the Icy Sea. Yet the cold here is thought to be less, and the vegetation in summer to be still more luxuriant, than on the Lena. The Yakuts in the vicinity possess the finest pastures, and consequently unusually numerous herds. This pastoral wealth can alone explain the fact, that, in horses and oxen, 10,000 head of cattle arrive at, and pass over, the ferry annually. And M. Argunov assured me, that less than a half of these belong to Russian caravans from Yakutsk or Okhotsk, and all the rest to Yakutian travellers. In summer the latter come riding from all sides, accompanied by beasts of

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burden, to barter for flour out of the magazines at Aldansk, and for some other Russian goods with the merchants passing by.

A shocking instance of the disease which I had observed on the journey yesterday, occurred here again. In M. Argunov's yurt was a girl, ten years old, the daughter of a Russian settler and a Yakutian woman. She seemed to be perfectly healthy, when on a sudden, a few months before, this hereditary poison began to show its effects, and developed itself with fearful rapidity. There was now to be seen on one side of her head a bare stripe, which was not above an inch wide, and had a healthy growth of hair on both sides. It extended in a straight line from the skull forwards, and terminated in a sore-looking stripe of the same width on the forehead. The prolongation of this downwards had involved half of the left eye, and attacked it herpetically. The cornea must have been completely eaten through, for the fluids of the eye were running out, and the whole had a horrible appearance. Yet the patient was without pain, and the rest of her face was quite free from disfigurement. It seemed as if the devouring virus attacked only those places which it reached as it descended by its weight. Yet I cannot suppose that the cause which regulates its propagation immediately, is really so simple; for, in that case, the uniform direction of its course would be interrupted by the position of the patient when sleeping: yet, among the external characters of this eruption, one of the most constant is, that it propagates itself from above downwards in directions parallel with the mean line of the human body.*

* Dr. Küber, while accompanying Wrangel's expedition to the Icy Sea in 1821–3, observed among the Yakuts of the circle of Srednekoluimsk, a disease which he pronounces to be elephantiasis. It always proves fatal among the Yakuts, who have no medical assistance, but Dr. Küber is of opinion that it would yield to proper treatment.

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CHAP. XVII.

WHITE HORSES. — THE WHITE RIVER. — THE TUNGUZIAN HUNTER. — SNOW SHOES. — REAPPEARANCE OF REINDEER. — AN AWKWARD ADVENTURE. — CHERNOLYES. — ELEVATION OF THE PLACE. — YAKUTIAN BUTTER. — SNOW SHADES. — GARNASTAKH. — A TUNGUZIAN FAMILY. — FIREARMS. — THE LAST OCCUPATIONS OF WINTER. — CARD PLAYING. — SHYNESS OF TUNGUZIAN GIRLS. — SYMPTOMS OF SPRING. — EFFECT OF THE CHANGE ON THE NATIVES. — ELEVATION OF THE WOODS. — LOADING THE REINDEER. — DIFFICULTY OF RIDING ON DEER. — CHASE OF THE ARGALI. — SUPERSTITIOUS USAGES WITH RESPECT TO GAME.

April 22. — We staid till nine o'clock with Argunov and his wife, who thankfully accepted of me some tea, for their stock was consumed and the arrival of a supply from Yakutsk was not to be expected for some months. They now commissioned me to bear their compliments and salutations to all the officers in Kamchatka, and to a priest in Kadyak. Fourteen horses were then saddled and loaded, and we were dismissed — myself, the Kosak, and the two Yakut carriers — into the *not Russian* or savage desert, with loud blessings. From this place we had to make a journey of seventy-five versts to the next Yakutian dwelling with the same horses, but there is shelter for travellers in a yurt on the way. We went for some versts along the border, on our left hand, of the valley of the Aldan, which is much wider, as far as I have seen it, than the river which it embraces. This flows, near the ferry, from east to west; but, both above and below that place, it inclines to the direction of the meridian. In the declivity, along which we rode, about half way up, lay embedded in yellowish loam, blocks and boulders of coarse-grained

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sandstone, formed of comminuted quartz and feldspath.*

We left the valley before it turns south, and then passed over thickly wooded hills, and through the fenny hollows between them. We could again perceive, from the monumental posts set up by travelling Kosaks, that man had been here before us. We found, also, in one of the thickest parts of the forest a great quantity of hunting gear. It consisted of unset traps for squirrels and ermines, a pair of snow-shoes, and a few other things, which some Tunguzes, roaming through the wood, had hung to the trees to enable them to find their way back more easily. They were themselves hunting at present in some other part of the forest. Tunguzian hunters come in this way, several days' journey from the mountains, because the Yakuts, in their fixed habitations, have enough to do to take care of their cattle, and give but little attention to the business of the chase.

We found to-day very deep snow on the marshes, on which grow only bushes of willow and alder. Our horses sank above the knee, but yet contrived to get sure footing. They are used in summer to similar, and even to much greater, hardships, for they have then to wade for days together, and when the heat is excessive, through swamps; are tormented by stinging insects, and carry at the same time loads of six poods, just as they do now at the more favourable season. Here are to be seen none but white horses. They are of moderate size, and of a strong bony figure, the peculiarity of which is enhanced by their long hair. Yet I found them to

* I learned subsequently that Sauer, in Billings' expedition, had seen petrified trunks of trees in a sandstone on the banks of the Aldan. These appear from his description to have been above Aldanski perevos, probably close to the river, whereas we passed some versts further north. (Sauer's Expedition to the Northern Parts of Russia, &c., p. 30.)

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be sensible as well as strong, and could trot them without danger even on the ice. It must be allowed, however, that the Yakuts in Amginsk, in Nokhinsk, and at the Aldan, had, in a very friendly manner, taken care that the owner of the caravan should have the smartest and gentlest horse, and a good saddle. They called me, on such occasions, *toyón* or the lord, or sometimes *ogónnyar*, a title of honour, which, according to the Russians, signifies "venerable elder," but is also given to young people as a mark of respect. The saddles here are very like what we call Hungarian saddles. They are stuffed in such a way that the rider sits almost on the front peak. The custom is to ride with short stirrups and bent knees, so as to leave room behind the leg for some cross bags, which hang down from the crupper of the saddle. Travellers who go alone carry all their provisions in this way, but particularly a skin, which in summer is filled with milk, and in winter with Yakutian butter. But even in case of travelling with a caravan, these cross bags are of great use, for each horse's load is then tied together into a single piece, which is never unbound except at the halting place at night. Each of us, therefore, took in the morning from the larger sacks as much black biscuit as he wanted for the day, with some dried meat, and the necessary quantity of tobacco. I carried, also, at my saddle, the hammer and compass for geognostical observations, and the stones which I found in the course of the day; but the barometer was fixed to a strap over my shoulders.

A little before sunset we came to a river, which was named Bielaya or the White River. At present this name seemed not to suit it, for its ice was of the most beautiful emerald-green colour, such as I had seen before only in the ice of the Angarà at Irkutsk, and in the water of the Upper Rhine and some other of the Swiss rivers. On the left bank of the Bielaya,

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which was here not above half the breadth of the Amga and the Aldan, stood a wooden board, with this inscription, "Bielskyi perevos (ferry of the Bielaya); it may be crossed for five kopeks;" and opposite to it was a small yurt, now completely buried in snow, but which is inhabited in summer by the ferryman. Both banks are formed by steep but low rocks of compact limestone, which, whether examined in small pieces or in the mass, closely resembles in structure the rock which bounds the Lena from Kirensk to Yakutsk.

We rode on the left bank of the Bielaya about three versts up the stream from the ferry, and then came to a yurt, the chimney of which was throwing out showers of sparks. This was an ownerless roof under which we were to spend the night, or, more correctly, it was the common property of all who passed that way. We found in it to-day one of those Tunguzes, whose implements we had seen in the forest. His own dwelling lay above 100 versts from this yurt; but he had been living here some time with an unmarried daughter, who shared with him the occupations of the chase and the journey. He had but just returned from the wood, and was drying his clothes at the fire. The young woman, with whom we became better acquainted in the sequel, was named Daria. She might have been about twenty years of age, and was not tall, but very strongly built. Frost and sun had completely embrowned her face, and had swelled the cheek-bones and the lids round her eyes; but her pliant activity, and readiness to exert herself under all the hardships of the road, allowed her to exhibit a naturally graceful carriage.

She seemed involuntarily to enter on the office of taking care of every one in the crowd, and helped, unsolicited by the Kosak, to prepare the usual meal. Snow was thawed in the kettle, both for drinking

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next day and to make tea, as well as to boil a porridge. When the meal was over, every one took his pipe, and our female comrade emptied hers as perfectly as the men, and with even more zeal.

Among the travelling gear of the Tunguzes, I here examined the snow-shoes more narrowly. They closely resembled those of the Ostyaks, being boards about five feet long and four inches wide, shaped somewhat like a canoe, and with the points turned up a little. They are fastened on by means of two loops made with thin straps, fixed close together near the middle of the board. First, the foot is put through the hindermost and largest of these loops in the reverse position, or so that the heel is towards the front of the shoe; the foot is then turned round into its right position, and thus the loop into which it was inserted becomes crossed behind the heel; the toes are then thrust into the smaller loop or anterior leathern ring. The Tunguzes, and their neighbours the Yakuts, fasten with glue, on the under side of the snow-shoe, a strip of horse-hide, with the hair turned backwards. Snow-shoes of this kind are here indispensable for the hunter, and for every one who wishes to quit the beaten road, as without them one sinks above the knee at every step. Here also I saw reindeer again, for the first time since we took leave of them on the 18th December, among the Ostyaks of Beresov. Our Tunguzian hunter had ridden here upon them, and now collected them in the evening round the yurt. He was desirous of returning with his daughter to the dwelling of his family, as we were about to go there, and proposed to travel on with his deer.

April 29. — Daria and the old hunter started on their journey, with their light baggage, early in the morning. We set out later, and rode up the Bielaya on the south side, and on its left bank. This river,

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at the place where it is usually crossed, lies 755 feet above the sea; but it flows with a rapid fall from the mountains above. Our road led at times between limestone rocks close to the river's banks, and sometimes at a distance from them, over plains thickly wooded, and falling to the river with naked cliffs. On this more elevated tract we rode about three versts from our night quarters, through a rocky glen. The reddish limestone standing there resembles, even to the minutest particular, the rocks on the Lena under the cave of Yerbinsk; and the edges of its strata are filled, as there, with fine crystals of pyrites, which are changed by the action of the air into iron ochre.

A little adventure rendered this place memorable to me. I had allowed the pack-horses to go on, as was my custom on such occasions, and quite at my leisure I was breaking off specimens from various parts of the rock. My horse was tied to a tree at a little distance, and seemed quite content with the unexpected rest. But when, soon after, I left him at liberty for an instant, while I was packing the stones and my hammer in the saddle-bags, he set off at full gallop over the snow-covered plain to the wood, where he soon disappeared from view. I now began to think in earnest on the desolation around me, for behind, as far as the Aldan, forty versts distant, there was but the yurt, now deserted, from which we had started; and, towards the east, it was impossible to find the habitation of man, unless I came on the track of the caravan. I followed in the direction of this, therefore, as fast as I could, and not without anxious fear of missing it. But running was here hard work for any one, even if he were not weighed down, as I was, with a heavy wolf's-skin pelisse. The snow was firm enough to bear a man only where the horses had trodden, but as often as I set my foot between the

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hoof-marks I sank to the middle and fell. After struggling on in this way for half an hour, I at last joyfully descried my Kosak. He was on the road holding two white horses, one of which was mine. The animal had only sought its companions: it had, therefore, staid in the road, and was caught at once.

We then approached the river again, and rode on its left bank over limestone hills, which are divided by cross valleys into separate ridges. The first of them lies, according to my barometer, 212, and another, 744 feet above the ice of the Bielaya, or 960 and 1494 feet above the sea. The cliffs on the right, or northern bank, were higher than those on which we were standing, and yet were exceeded in height by more distant summits, which were also to the north. Even upon these was still to be seen a thin covering of wood, and, therefore, they at present concealed from view the naked rocky chain which was visible from the high ground on the left bank of the Aldan. After a ride of forty versts from Bielskyi perevos, we came about eight in the evening to the end and aim of this day's journey — two large winter yurts, bearing the name of Chernolyés, or the Black Forest. They stand on a piece of level ground, on the right bank of the Bielaya. We, therefore, rode across the ice of this river, which was already so thin in some places that it gave way under our horses. The water, however, was only five feet deep, so that we got through with no worse accident than the wetting of some of our baggage.

These yurts of Chernolyés form the last Yakutian place of habitation which we met with on this journey; during our residence here, the barometer indicated an absolute elevation of 985 feet, allowance being made for the continual diminution of atmospheric pressure, at the same height, between

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Yakutsk and Okhotsk.* Yet, still, there are horses, and a considerable stock of horned cattle, kept here throughout the winter. To-day I was treated, for the first time, to the most important production of the dairy in this country, — I mean what is called Yakutian butter. This is, in fact, an oily substance, of an agreeable subacid flavour; and I could plainly distinguish, in the frozen pieces set before us, a portion that was thick and exactly like our butter, but coagulated in smaller lumps, and which was beginning to melt, even with the heat of the room. This is eaten, during the winter, by the Yakuts in large pieces without bread; I could also understand what I had previously heard, respecting the drinking of the melted butter, and of its intoxicating effects on those who take it to excess. Its sourish taste proves that a considerable portion of it has undergone fermentation, and is therefore in a state capable of yielding a vinous spirit. This article of subsistence is kept in vessels of birch-bark, a number of which were now standing in a cellar dug in front of the yurt, and covered with boughs of trees; subsequently, I saw in the Tunguzian winter-dwellings, many similar subterranean magazines.

Another practice, common to all the Yakuts and Tunguzes, came more immediately under my observation on this day's journey, and in these yurts, although it was not till some days later that I was convinced by experiment of its importance. I allude to the means of protection against the dazzling light, and particularly from the sun's rays reflected from the snow. The Yakuts all use for this purpose a very neatly made, narrow-meshed net of black horsehair. It is about six inches long, and broad enough

* If this peculiarity of the East Siberian atmosphere were not taken into account, the heights assigned to the places here would be erroneously increased by 240 feet.

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to cover the eyes, and has its elliptical border sewed to a thin piece of leather in such a way, that the side turned to the face is a little concave. It is then fastened with thin leathern loops to the ears, so that it has exactly the look of our European spectacles. One of these eye-protectors was given to me here as a present, and at first I thought of treasuring the friendly gift; but, as the weather grew bright, I found myself obliged to tie it over my spectacles. This simple contrivance moderated, in the most agreeable manner, the dazzling light which, in a few hours, had brought on a violent inflammation, with a continual flood of tears from my eyes. Here, therefore, no one thinks of going on a journey without a snow-shade. They are carried, with the other most necessary articles, in the girdle, and are generally used when the sky is quite clear, and the sun at a certain height. But, besides, I saw in Chernolyés, and at some of our previous halting places, old women wearing them to protect their eyes from the blaze of the fire, at which they are constantly employed. Perhaps their eyes had been previously weakened by worse trials, and so rendered irritable. The Siberian-Russians in general call the snow-shade *syetká*, that is, net; a name very applicable to it, as made by the Yakuts, but not to another kind of shade, to be described hereafter, which is exclusively used by the Tunguzes.

Daria and her father had already arrived in Chernolyés earlier in the day, but stayed with us during the night, in order to let the rein-deer rest. These were feeding in the neighbourhood of the yurt, and their owner allowed me here to try to ride one of them. Of this experiment it is enough to state, that I was unable, without assistance, to mount on the back of a very patient animal, and then I fell, even

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at the first step, from the saddle down on the frozen snow.

April 30. — About eleven o'clock we left Chernolyés, where I made the usual geographical and magnetical observations; and we rode — our last stage on horseback — to the yurt of Garnastakh. The distance, in a straight line, between these places, according to my reckoning, is only thirty-one versts; but, on the authority of the post-carriers, it is generally assumed to be twice as much. On the latest Russian maps, also, Chernolyés was placed about 1°·5 too far east, and half a degree too far south; Garnastakh, and the other inhabited places to be mentioned hereafter, were omitted altogether.

We again followed the Bielaya upwards towards its source, but avoided its windings during the first half of the way, when we rode repeatedly through larch woods on the mountains on one or the other side of the river. The valley itself is here every where shut in by high rocks, and in these I saw on our right, just behind Chernolyés, the limestone strata bent and broken in the most remarkable manner. About twenty of the layers, each about a foot thick, form at first a fan-shaped profile; then the last of them is bent in a serpentine line, reaching from the top half-way down the cliff, and thence turning off, still with small undulations. One verst above this place we found the limestone flattened down completely; and then, instead of it, in a cross valley, by which we turned to the right from the river, low and rugged rocks of black and heavy basalt.

On the last third of the way, the valley is much wilder and of truly Alpine appearance. The road winds constantly between two perpendicular walls of limestone rock; the height of which goes on increasing, uninterruptedly, till it reaches 1170 feet above the river. The mass is riven in the direction of the

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strata, and by cross clefts, the direction of which changes here often and suddenly. Some larches stood singly at the uppermost edge of the rocks, and a raven that was croaking there, seemed to be the only inhabitant of the wilderness. The Bielaya, which completely occupies the bottom of this glen, is not half so deep here as at Chernolyés, but flows much more rapidly, over fragments of rock and rounded shingle. Its ice was of the most beautiful green; but was already become so weak, that our horses went through it at every step, and here and there waded in perfectly open water; and yet the snow in the country round was still as hard as in the middle of winter.

Soon after we saw before us an abrupt mountain ridge, of the same height as the surrounding precipices. It divided the valley into two arms, of which that on the left of the river, or to our right, continued in the former direction, while the other deviated from it at a considerable angle. We then rode along at the foot of this mountain, which the Tunguzes name Ulag-chan, till we came to its northern side. There, on the tract between the Bielaya and its tributary just mentioned, stands the yurt of Garnastakh, a hut, like those of the Yakuts, built of the stems of trees, and among groups of bushes and tall larches, encircled on all sides by rocky mountains.

In this picturesque abode I stayed three days, and during the four following days I had several of its inhabitants for travelling companions. Thus, there arose between us that intimacy and mutual confidence, the value of which is felt only in a strange country, and on which are ultimately founded the sweetest and most lasting recollections of a traveller's life. It was already known that we should arrive here to-day; for the chief inhabitant of these yurts was that old Tunguze in whose company we had spent

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the night at Bielskyi perevos, and with the Yakuts at Chernolyés. He had arrived here with his daughter long before our slow caravan, and told us now that we should have to stay some days with his family, for a part of his herd was absent, not having yet returned from a journey into the mountains in company with the Yakutsk post, and the seven rein-deer which he had brought back with him were far from being sufficient for our wants. They hoped, however, for the speedy return of the absent deer, for the Russian courier had announced that we followed him closely, and should soon want them. He had, at the same time, spread abroad the Yakutian story respecting the object of my journey, and I was asked immediately whether I would look for the star in this place also.

The yurt of Garnastakh resembles those of the Yakuts in the interior; that is to say, it consists of a single square room, with a flat earthen roof, and only so large that the fire-place, of beaten earth, may warm it quickly and completely. It is much more thickly peopled at times than it was during our residence there, and yet there were sleeping in it to-day, besides ourselves, ten members of the wandering family. Among them was the head of the house himself, whom we have already mentioned, two elderly wives and their daughters. One of these was Daria, whose acquaintance we had already made; a younger daughter, named Eudoxia, was likewise unmarried; the eldest had lost her husband a short time before, and had now returned, with two children, to her father's yurt. Besides these, there were with us to-day a young Tunguze and a Yakut, of whom it was said that they were wooing our host's daughters, and helped him in his journeys by way of paying the koluim. These people, like all the Tunguzes, descend into the thick of the forest as soon as the snow begins to melt on the roads. They live in summer as they

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do even now during the winter, on the produce of the chase; but indulge at the same time their roving disposition, and erect their birch tent every day in a different place. These yurts of Garnastakh, and all the other winter yurts on the mountain, are visited by the Yakuts who are sent into that quarter from Yakutsk with horses.

It snowed from morning till evening, with a light east wind, and the temperature of the air varied in the course of the day, only between —3° R. and +2° R. We looked out in vain for the rein-deer, but were really glad at their delay, for domestic life with the Tunguzes was something new to us, and agreeable. Early in the morning our host again went out to the chase. The horses which had brought us here went back with our Yakut carriers to Chernolyés, and he availed himself of one of them for a part of his journey. The axe for cutting wood, a kettle, a leathern bag with dried meat, and, above all, a pair of snow shoes, were hung to the saddle; and the dog, which shared his labours, was led with a cord to the scene of action. It was of the size of a large terrier, but slim and slender, with black shaggy hair, and a fox's muzzle.

All the Tunguzes of the Aldan have fire-arms, as well as those on the Lena; and our friend also, like the rest of our acquaintances in the mountains, carried an extremely small piece, scarcely two feet long, which reminded us of the carbines of the Tyrolese sportsmen. The Russian merchants bring the locks and the rifled barrels. These are extremely strong in the iron, but bored small, so as to admit only buck shot. The stocks, to suit the fashion here, have, instead of the butt, only a board, a quarter of an inch thick, the broader end of which is cut, as with us, to fit the shoulder, while at the upper end is a forked prop, about three feet long, to rest the gun on when firing.

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It is fastened with a pin, on which it turns in such a way, that it lies back when the gun is discharged, on both sides of the stock. Snow shades completed the hunter's outfit. They were the black Yakutian shades; and it may be remarked, in general, that the inhabitants of Garnastakh deviated in many instances from the genuine Tunguzian customs, and adopted those of the other race in the neighbourhood.

We remained in the yurt with the women and the Yakutian servant of the family, who served me as interpreter, for Revyákin spoke only the Yakutian fluently. The women of the house and their unmarried daughters now sat down together on the floor to their work. They were occupied to-day with the last cares of winter, for they were sewing the cover for a birch tent, and were mending the men's rein-deer clothing, the *torbasás*, or water-tight boots (here called *sári*), and other articles necessary for travelling. Here, as among the Ostyaks, the mode of sewing is with short rein-deer sinews, which are split into threads of the desired thickness; these are then wetted with the mouth, so as to become clammy, and the two ends being passed through holes in the pieces to be joined, are tied together. The Tunguzian women despatch this business by rolling the threads which they are going to use with the open hand on the right knee, and it is therefore the sign of an industrious woman that her leathern drawers are all whitened on that side, and covered with glue. The pipes which the Tunguzian women, too, carry at their girdle, were frequently smoked during the time of work. The tobacco was mixed for this purpose with thin, and always freshly-cut, chips of fir wood. The pipes were emptied in three draughts, the smoke being swallowed at first, and, after a little, partially expelled in clouds through the nose.

In the afternoon, the girls went to the river hard

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by, to cut ice; which was, in part, melted in the kettle, and used for cooking, and a part of it was thrown into a wooden vessel near the fire-place, and kept for drinking. I went to examine a cliff which projected in a very striking manner from the snow-clad wood on the northern side of our dwelling. It consisted of a dense grey and yellow limestone, of very acute-angled and somewhat shelly fracture, and lying in strata two inches thick, which fall rapidly to the south-west. The face of this rock could be reached only in snow shoes, and in trying to use these I found that they are very troublesome and inconvenient to those who are not accustomed to them. They must be bound firmly to the feet, which, in moving forwards, must not be brought too close together, nor turned outwards, or else the shoes come into collision.

When the work was finished, the girls began to employ themselves in the yurt with the business of decoration. In an elaborately made box of birch-bark they had treasured up some studs of brass and lead, beads, and old brass springs. These last were now cut into small pieces, and strung with the studs and beads so ingeniously, that a very pretty ornament for the head was made with very poor materials. The Yakut had lent the girl his assistance in making this band, at her earnest request. I was more surprised at another of their amusements, respecting which, however, I subsequently learned, that it is much in vogue with all the Yakuts and Tunguzes.* A pack of cards, so much worn out as to be hardly recognisable, was brought to light from a corner of the yurt. They played, two at a time, in turns, with-

* The Tunguzes, in the circle of Koluimsk, are passionately fond of chess. They carve the chessmen very elaborately out of mammoth's teeth. These northern nomades probably received their acquaintance with this game, and taste for others, from China at a very early period.

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out any stake, but very eagerly. The Russian names of the cards are those used here. There were only two inhabitants of the yurt who took no part in these amusements. One of them was an old Tunguzian woman, of very singular and spectral look, who stayed constantly at her work, murmuring, at the same time, songs between her teeth; the other was the young widow, to whom, as it appeared, a corner of the yurt had been assigned for herself and her children; she sat there, rocking her infant's cradle. This was tied to a balancing pole, and by means of it fastened to the ceiling, as is the custom in Russian villages. The cry of the infant, and the howl of two young dogs, which the girls had to take care of, were often mingled with the dull song of the old woman.

For supper I treated the whole company to black biscuit, which was devoured as the greatest dainty, along with the usual soup made of smoked rein-deer's blood, with dried, sliced flesh of quadrupeds and fish. The gratitude of the ghastly old woman made her quite sociable, and even jovial. She translated for me, with the assistance of our two interpreters, several Russian words, and sang some of her melodies, a little more intelligibly than before. These resemble closely the songs of the Yakuts, and both may be best compared to an utterance interrupted by sobbing or yawning. But the old woman would not give me the words of any of her songs. She said that the Tunguzian women dwelling further to the east were acquainted with much finer and longer songs. There was no doubt that she was extemporising, as I subsequently found was the case, also, with the fair minstrels in the east, to whom she referred me. I then turned the conversation to the account given me in Krasnoyarsk, of a peculiar Tunguzian custom, namely, that of concluding the dance, in which both sexes join, by stripping off the clothes. There can be

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no doubt that this statement is, in the main, true, for Fédor, who had previously had intercourse with the Tunguzes of this quarter, but had never any communication with the Russians of Krasnoyarsk, confirmed to me, fully, what I had heard when I first asked him alone about it. My direct inquiries on this subject from the men here, were seized upon as if they suggested a well-known subject of joking; and the old woman heard me, with that awkward looking merriment which is produced among us by a pleasant anecdote bordering on indecency.

At last every one sought his berth for the night, having first provided himself with a lighted pipe. The girls took possession of the narrow passage behind the fire-place, and after a little time I saw Daria's Yakutian friend follow them. It may be concluded, therefore, that between affianced Tunguzes, before the payment of the kolúim, a kind of relationship subsists, like that known in Switzerland by the name of the kilchgang; and from what I heard at Delgeisk, on the Lena, it seems that the same custom prevails among the Yakuts. And here I must mention the remarkable difference which I soon observed, not only in the external appearance, but in behaviour, also, between the two unmarried girls in the yurt. The younger, and still unaffianced girl, was much fairer and slenderer than Daria, evidently because, in the course of their wanderings she had not yet taken part in the drudgery of the nomadic housewife. She wore, also, generally, a handsomer kind of clothing, made of thin, tanned rein-deer leather, instead of the fur surtout of travellers. But that which chiefly distinguished her, was an extraordinary shyness or timidity, which I frequently afterwards witnessed in other Tunguzian young women, and sometimes in Kamchatka. If I happened by accident, and without thinking of it, to meet her alone before the yurt, she

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would scream, and run away in the greatest fright. I learned, subsequently, from Russians, of whom I made inquiries, that this behaviour is founded on an ancient and general custom of the Tunguzes and Kamchadales. According to their view, a matrimonial engagement is not definitively arranged and concluded until the suitor has got the better of his beloved by force, and has torn her clothes. The maiden, however, must defend her liberty to the utmost, and consequently she dreads, as we had occasion to observe in Garnastakh and elsewhere, attacks of this kind, even where they are not previously threatened. I never saw an instance of such timidity in the interior of the yurts or tents; and it would appear, therefore, as if a law which is held to be one of the most important in the code of the Mongols and Buraets, prevailed also among the Tunguzes. This law allows offensive assaults on women to be avenged by shedding of blood, yet only in case they have been made inside the tent; on the other hand, the assaulted woman bears the whole blame if she ventures indiscreetly to leave her natural place, the sacred and protecting hearth.

May 2.—To-day spring again appeared in the garb which it had worn six weeks before in Irkutsk. The sky was perfectly clear, and dark blue from morning till evening; and although the air, between the snowy mountains, did not attain a warmth exceeding +2° R, still the brilliant light seemed to fill everything with new life. The Tunguzes showed themselves most sensible of this, for every one staid to-day in the open air,—the fire-place was used only to dress the meals; the preparations, too, for the wandering summer life were now carried on with the greatest activity.

The girls went out at day-break to fetch ice, and then they began to wash and adorn themselves with

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unusual care, as if it were worth while to be beautiful only in the open air and bright weather. They put on the new head-dress, having plaited their tresses afresh, and their jet black hair hung somewhat less than usual over the forehead. The ladder to the flat roof of the yurt was also much employed. The old women sat there from morning till noon, and hummed their songs in the sunshine, as they did yesterday at the fire. All the baggage for the summer wanderings was spread out beside them on the roof, to get the air and sun; the birch-tent, the harness, the pack and riding saddles for the whole herd, and the saddle-bags, in which the provisions and various little property of the roaming family were already stowed. For the tent-covering, several pieces, about a foot wide, are wound round the framing. Each of these pieces consists of oblong strips of birch-bark, which are sewed by their edges to straps of leather, and are then rolled up for the journey.

The saddle-bags which the Tunguzes employ in their wanderings, are less than those of the Yakuts, but have the same cylindrical form, and are made, like them, of white and smoothed leather. All these things were arranged on the roof, side by side, in rows, just as is done before the tent in travelling; and in this beginning of the new domestic economy, there reigned a neatness and good order which contrasted most remarkably with the interior of the yurt. Every forgotten article of furniture was now dragged forth from the dark and dusty corners, and one might imagine, with something of German superstition, that they were witches, not Tunguzes, who rose up to celebrate the beginning of May. I understand thoroughly the curse of the Tunguzes, "Mayest thou be house-tied like the Russians;" and, also, their practical belief that "a dwelling grows rotten," when people stay too long in one place. They are a lively

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and light-hearted people, and however the graces of outward appearance may gratify their cheerful humour, still they are not disposed to sacrifice their freedom or convenience for the sake of them. Frequent journeys seem to them, therefore, to be the most natural, and only applicable means of keeping their property in good order. Those among them who, like our friends at Garnastakh, are obliged to fix themselves in winter habitations, might be reasonably suspected of innate uncleanliness, if we did not know how they long for the summer, which renews and beautifies for them, not only nature, but even the artificial conveniences which surround them.

About noon, the twelve rein-deer, which we were expecting, arrived, driven by an elderly Tunguze. They had been detained by deep snow in the mountains, and by the rise of the rivers. Here I was much struck by the influence of the season on these half-tamed animals; for among the Ostyaks I had seen rein-deer only with grand antlers, four feet high, but here such cases formed the rare exception. They had by this time nearly all cast their old antlers, and most had, instead of them, stumps, already well grown, of the new, which were covered with a soft, mouse-coloured down. Yet there was a considerable difference in their development, connected evidently with the difference in the colour of the deer. I had already observed something of the sort at the Obi, yet it was here that it first appeared quite manifest that the change and renewal of the antlers were delayed by the same circumstances which change the brown coat of the deer into white. It was only on snow white deer that I now saw antlers of last year; but the new ones were best grown on those of a dark-brown colour. Some had only the head and the rump snow white, but the rest of the body dark brown, and these had already young antlers of considerable size. They

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were among the handsomest of the herd, for the grey and silky down on the horns looked pretty on the white ground of the head.

A branch of a tree was suspended to the neck of one of the white deer, and then they were all driven to the rest of the herd, in a mossy part of the wood. They were to be loaded next morning, and to start on the journey with us. Some of them, however, were driven from the yurt with difficulty, because they had had the luck, on their arrival, to lick from the snow their driver's urine. They were now looking for a renewal of this pleasure, as I had formerly observed with the Ostyak and Samoyed rein-deer, and subsequently with all those of the Tunguzes.

In the forenoon, I had observed altitudes of the sun, to determine the geographical position of Garnastakh, and its magnetical conditions; and I had ascertained, by terrestrial angles, and a base line which I measured in the vicinity of the yurt, the height of the mountain Ulag-chan.* It lies nearly south of the yurt, and its slope, which begins perceptibly at a distance of about 1000 feet, mounts rapidly (with 20° inclination) till it attains an elevation of 1245 feet above the level of Garnastakh. Its ridge, or longish summit, consists of very rugged and naked crags, separated one from another by vertical clefts. Below that, the gentler declivity is covered with larches. The thick wood, composed wholly of trees of this kind, terminates at the height of 715 feet above the plain on which we were standing; but single larches may still be seen to the height of 965 feet. Now, Garnastakh has an absolute elevation

* The direct distances are, — from Yakutsk to Garnastakh, 208 geographical miles; from Garnastakh to Okhotsk, 228; and from Yakutsk to Okhotsk, 424 miles. The traveller is led over the mountains, more by accident than design, almost in the shortest possible line to his destination.

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of 1520 feet, and, therefore, the larch can, in this region, flourish at the height of at least 2485 feet above the sea. Perhaps they might have spread themselves still higher up, if they were not prevented by the ruggedness of the rocks that crown Ulag-chan; but as a gradual decrease of the wood is observable at some distance below the crags, it may be inferred, that the extreme limit of the growth of trees is here not near so high as it is further east, on the main chain of the Aldan mountains, where that limit lies, in fact, 1530 feet higher than the larches of the Ulag-chan. On the other hand, it seemed now extremely likely that the temperature of the ground, for places having the same latitude and absolute elevation, was here again much more favourable for vegetable life than under the meridian of Yakutsk. For under that meridian, a point similarly situate (in respect of latitude and elevation) with the spot on which stood the last larches at Garnastakh, would have a mean temperature of —8°·4 R.* Now, though the plains about Yakutsk, with a mean temperature of —6° R., are covered with fine woods, yet we must not imagine that these would continue to flourish if the temperature of the ground were reduced by —2°·4 R.; and if, moreover, this loss were brought about, as is always the case with increasing elevation, by a diminution of the summer heat, and not by the far less prejudicial increase of the cold in winter.

In the evening a search was made in the yurt, successfully, for a balance which the Tunguzes had procured, in order to protect their rein-deer against oppressive loads. They were not a little proud of the possession of this Russian apparatus; and, al-

* The ground temperature of —6° R. for Yakutsk, is to be increased about 0°·4 R., as the latitude of Garnastakh is 0°·53 less than that of Yakutsk, and, on the other hand, to be diminished by 2°·8 R. on account of the difference of 2200 feet in elevation between the two places.

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though they handled it rather awkwardly, yet they were able to perceive from it that a good deal of change was necessary in the distribution of my luggage. None of their rein-deer can carry more than four poods, or 160 lbs., and they were strict in requiring that the two packages placed on each, should counterbalance each other exactly. Among the preparations for our journey, I remarked a very disgusting, but at the same time extremely useful, proceeding of our hostess. She saturated very carefully the outsides of the *sari*, or long boots, which were about to be worn on the road, with warm fish-fat; and the rancid, offensive smell of this fluid did not prevent her filling her mouth with it, and then squirting it out, refined between her teeth, upon the leather, into which she rubbed it with the open hand. The disagreeable odour of the old Tunguzian women is derived, in a great degree, from this kind of work. Their disadvantage in this respect will, nevertheless, be readily overlooked by any one who, protected by the excellent leather which they prepare, has trudged through melting snow, through quagmires and ice-cold rivulets, without the slightest inconvenience.

May 3.—The rein-deer were driven before the yurt early in the morning, and as a good moss-field had been found for them at no great distance, this part of the business was very quickly despatched to-day. The women rendered especial assistance on the occasion, for they went along with the men into the wood, where they cautiously enclosed the herd on one side, and then suddenly, and with a yelling cry, ran after them. The deer immediately fled, always close together, and continued running so long as the cry lasted. To catch the deer singly, the people had recourse to a long strap, as I had already seen practised among the Ostyaks. The strap, in Garnastakh, was eighty-four feet long. It was held a few feet above the ground,

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by a number of people who had placed themselves in a semicircle near the yurt. The drivers pressed the deer on slowly towards this check, and continued urging them till they were at last surrounded, and the halters were put on them. Only one or two of the younger and more timorous animals broke away, and got off, until they were again taken with the line, but in a more artificial manner. It was then employed as a lazo, (in Russian, *arkàn*,) in the use of which the Tunguzes, like all other possessors of half-wild herds, display extraordinary dexterity. The man who holds the lazo keeps whirling it above his head till the deer comes into the desired position. He then throws the coil, and with such precision that the front of the noose falls almost always on the breast of the deer, which is held fast at once, though in full run.

The rein and head gear used by the Tunguzes for the rein-deer, rest on the same principle as those adopted by the Ostyaks and Samoyedes; they are, nevertheless, essentially different in some particulars, from all the contrivances of this kind which I have previously seen or described. Here, too, the guidance of the animal is effected by pressure near the eye; but to produce that pressure, there is here used, instead of the Samoyedes' bone hinge, only a ring of leather, more or less contracted. The deer-owners on the Obi place the bridle on the left eye, and always on its upper border; here, on the other hand, the Tunguzes fix it on the right eye, and, either from caprice or accident, sometimes above, sometimes below, the eye-ball. In order to arrive at a more exact conception of this Tunguzian mode of bridling, let us imagine, in the first place, a thin strap, made into a running knot or simple loop, yet so that its ends have a considerable length beyond the part thus joined. The loop is then put over the muzzle of the deer, and

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carried up till it lies on the upper eyelid, or else on the under lid; it is then drawn tight in this position, and the ends of the strap, which cross each other at the animal's throat, are tied together behind the antlers.

But, to give effect to this arrangement in riding, another strap is fastened to the preceding, and goes along the right side of the deer's neck to the rider's hand. The turning to the right, then, is effected by a single pull of the rein, and this is a natural sign, for the pressure which it makes on the eye is avoided by the rein-deer by turning its head to the right. The sign for turning to the left, on the other hand, is purely conventional. It consists (like the sign for turning to the right among the Ostyaks) in a repeated jerking of the rein. The animal's obedience to this sign must evidently be the result of use, and is not prompted by any feeling.

When the bridling is finished the rein-deer are saddled, those destined to bear loads, as well as those intended for riding; and the saddle is always placed forwards on the shoulder, close to the neck. The pack-saddle is formed of two cylindrical cushions, eighteen inches long, of smooth leather, which are joined together, parallel to each other and about nine inches apart, by two convex wooden yokes. When this saddle is placed on the rein-deer, the cushions alone touch him, and his high withers lie between the yokes, but at a somewhat lower level. When, therefore, as in the case of my baggage, there are boxes two or three feet long, and one and a half or two feet high, to be carried, a straw mat is first placed on each side of the animal to prevent its being galled; these mats are tied together by short thongs, which rest on the pack-saddle. Each box or package is tied round with a cord, which is made into a loop at the upper side; a stick is then run through the loops of the two

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packages that go together, and is set with the whole load across the saddle. The mode of proceeding, indeed, is the same here as in the case of pack-horses: a man on each side raises one of the packages till the loops meet, when the stick is run through them, and the load is thus at once rested on the saddle. I have already mentioned, that the Tunguzes themselves carry a great part of their property in small, cylindrical bags of smooth leather; when these are employed, the ornaments of the pack-saddle are more perfectly conspicuous between them. The front of the wooden yoke is always adorned with carving, and usually, also, with metal plates. The ends of the white leather cushions are fringed with beads, or bordered with variegated leather-work. Similar ornaments are to be seen on the bridle, also, at the right ear of the deer, where the two ends of the head-gear are fastened together.

The riding furniture of the Tunguzes is far more simple, for it consists of nothing but a flat cushion, stuffed about two inches thick, which is placed, like the pack-saddle, forwards on the rein-deer's shoulders. In front, where the rider sits, it is considerably wider than the animal's back, and projects beyond it, therefore, on both sides. Behind, on the contrary, it is very narrow, and bends upwards a little. This saddle is fastened by only a single girth, which is not placed over the middle of the saddle, as with us, but on the back part of it, and is fastened underneath, just behind the rein-deer's fore-legs. They then gave me a staff, about five feet long, and bid me mount, by means of it, a full-grown male rein-deer, the back of which was not less than four feet high, as, indeed, is ordinarily the case with Tunguzian deer.* I tried at

* I must here remark, that all the Lapland rein-deer which I have seen in museums and menageries, were but dwarfs in comparison with those of Northern Asia, and seemed to have lost, with their size and strength, much of their beauty of form also.

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first to mount by what appeared to be the simplest way, that is, by swinging myself up as we get upon a horse without stirrups; but the Tunguzes were immediately in a fright, and cried out dolefully, "You are breaking our rein-deer's back." And this apprehension was well founded, for as soon as the animal's spine is touched, but a few inches behind the saddle, it bends its knees, and sinks as if under an insupportable load; but it is impossible to mount by leaning on the deer's shoulder, which is alone capable of bearing a weight, because the lateral jerk, which is unavoidable, is sure to displace the saddle.

There is no mode, therefore, of mounting the rein-deer, but that which the Tunguzes have adopted; and however inconvenient this seemed to us at first, the practice of a few days made us sufficiently expert. The rider, holding the bridle, stands at the right side of the animal, and not on the left, as with us, his face turned forwards; he then raises his left foot to the saddle, which he never touches with his hands, and springing with the right leg, and aided also by the pole, which he holds in his right hand, he mounts into his seat. The women and girls are as expert in this jumping as the men, and I recollect to have seen but once a Tunguzian woman receiving assistance as she mounted.

To-day it was manifest that they had not told us the true number of the herd at this place, for we took twenty-three rein-deer on the journey with us, and yet above ten others were driven back to the wood. The latter struggled much more against their separation from the more numerous and older portion of the herd, than these did against the loss of liberty. Of the rein-deer which accompanied us, six were saddled for riding, fourteen more carried packages, and the rest remained at first free to take the place of those that should be fatigued. Yet it was only my

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own property which required so numerous a troop, for the baggage of our carrier consisted chiefly of a few saddle-bags of dried meat, an iron kettle, with snow-shoes and a gun; he had also a fishing-net, for the Tunguzes intended to turn this journey to account in the sequel, as they always do, for hunting and fishing also. They had tied the laden deer together into four sets, each of which had its own driver. At the head of the first of these rode Daria; then followed the young Tunguze, whom I have already spoken of, and the Yakut servant, each followed by four laden deer; the rest were driven by the old hunter, who had brought back a part of the herd the day before.

Riding on rein-deer was as new to my Kosak as to myself; and, at the commencement of our journey today, we both almost despaired of being ever able to learn it. We fell from the saddle six times, at least, in the first quarter of an hour, but improved rapidly as soon as we discovered that the rider must not attempt to attach himself to the body of the rein-deer. He must, on the contrary sit, or rather poise himself, in such a manner that his body may continually, and with facility, as required, lend itself to a swinging motion. The Tunguzian saddle, as I have already stated, is very wide in front, so that the rider can touch the rein-deer only with the soles of the feet; but should he attempt, in order to keep himself in his seat, to press his knees against the cushion, he is sure to fall, together with it, immediately, for it is fastened loosely with the girth, on purpose, and is easily pushed on one side. The practised rein-deer riders acquire the habit, therefore, of striking gently with the heel, alternately right and left, at every step, just behind the animal's shoulders. This is not done for the purpose of stimulating the deer, but because the motion described is the surest means of maintaining

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equilibrium, and contains almost the whole secret of the Tunguzian art of riding. We found, therefore, that all difficulties vanished as soon as we imitated them on the level road. At the same time, one gets involuntarily the habit of using the staff, employed in mounting, for maintaining the equipoise in riding; but whoever attempts, as we did in the first critical moments, to support himself in his seat by resting it on the ground, is sure to fall immediately.

We soon came again to the Bielaya, and followed it up along a narrow valley, enclosed by high rocks. The snow lay in great heaps on the river, and the ice beneath it was in many places so thin that the rein-deer fell through it; they then clambered, upright, from the holes, and gave us novices a second indispensable lesson, in a very impressive manner. On such occasions, it is necessary to sit more loosely than ever in the saddle, for if any attempt be made to hold with the knee, the cushion slips back a little along the spine in its inclined position; but the rein-deer, the moment it feels the weight on the back instead of on the shoulders, bends its haunches, and lets the rider slip to the ground. I fell again, therefore, in this place, into a puddle of water, ice, and snow, to the great amusement of our young and courageous Tunguzian damsel, who filled here, also, the most difficult post in the caravan. She rode forwards on the ice, and broke a path for us, with her rein-deer breast deep in snow. To me, in spite of our little mishaps, this part of the journey was quite delightful, for I had never seen a prettier sight than such a march of rein-deer over difficult ground. The rider who leads them beats faster and more uniformly with his heels; he rests the lower end of his staff, like a lance, on the right knee, while he holds the bridle tight. The rein-deer then carries his head erect, with lofty grace, and steps out more briskly than usual,

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while the short tail, raised upright, moves regularly from side to side. Then follow the laden deer, with the most uniform pace, each treading exactly in the tracks of the preceding one.

Towards sunset we were riding on the left bank of the river, in a storm of fine snow, when the cry of a dog after game was heard from the naked and almost perpendicular rocks of the right bank. The cry was lively and loud, but in very acute tones. The Tunguzes halted immediately; and we now saw, half way up the steep, five animals like goats, leaping with great bounds from crag to crag, and close behind them a black dog, about the size of a large terrier, of fox-like aspect, and with a short tail. I had scarcely observed it as it followed the rein-deer from Garnastakh. Three of the animals got off; the other two were driven by the dog on a column of rock, accessible only by a narrow ledge, of which he kept possession with continual baying. The old Tunguze now snatched up his gun, and ran, on snow-shoes, to the right bank. There he threw them off, and climbed through narrow crevices up the naked rock. We lost sight of him, and directed our attention to the dog, which had left its post for an instant, as if seeking some other way of coming at the game. One of the animals immediately made off, ascended to the summit of the ridge, and escaped like the rest. Only the last of them was now detained by the dog, which had returned to its post, when at length the old hunter made his appearance. He fired and hit — but not effectually — for the animal escaped with some heavy leaps to another pinnacle of the rock, surrounded by precipices, where the dog again kept it imprisoned. The hunter did not see where it had escaped to, and called to us to point out to him the direction in which he was to follow. A quarter of an hour elapsed before we saw him again making his

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appearance at a favourable point. We had alighted in the mean time from the rein-deer, and were awaiting the issue with impatience. Then a second shot was fired, and the animal fell. We all now made our way through the snow to the cliffs. The Yakutian driver scrambled up the rocks, and dragged the still breathing animal down to us by the horns. Then the hunter came slowly back and pointed out to us that both shots had taken effect. The Tunguzian gun was loaded with only a single buck shot, and yet the animal had two fresh wounds. But the first had not gone near enough to the heart. The animal, which had afforded us this pleasant and profitable spectacle, proved to be the Argali, or what is here called, the wild or rock-sheep — in Russian *dikyi*, or *Kamenyi barán* — the chubuka of the Yakuts. The individual killed was a full grown ewe, with very triangular horns, bent like those of wethers with us.

After so joyful an occurrence, there was no desire to leave this place in a hurry. The hunter went again up the rocks to try his luck, while the rest of us moved for our night's quarters, a little way down from the left bank in the wood, where we unloaded the deer and turned them loose. I had purchased from the huntsman the skin of the killed sheep, and now, with Daria and the young Tunguze, I went back to the ice where it was still lying. We took a reindeer with us to carry it; but yet, I could not persuade them to let me bring the whole sheep to the place where we were to spend the night, and where I might have performed at my leisure the operation of flaying it. They declared that such a proceeding "would spoil the hunter's luck," and that every wild animal must be skinned or cut up on the spot where it died; there the meat must be prepared for men, the dog must get his just share, and what remains must be left for the wild beasts.

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It was equally against their taste and inclination, that I insisted on having the skin taken off in the manner best suited for stuffing. They wished to begin in their usual way, by cutting up the skin at the legs; and it was not till I took the knife playfully from the young Tunguze, and made with it the cut up the belly, which was to satisfy them, that we began gradually to understand one another. He then remarked that my object was to preserve the skin entire, as they do in the case of ermines and other animals of fine fur. In these cases they begin by drawing up the skin on the lips, and then enlarging the mouth by an incision, they strip the whole animal through it. Still more argument and more persuasion were necessary, before I could get leave to take the leg-bones and head with the skin. The sheep was pregnant, and the Tunguze showed me, laughing, that he could squeeze some milk from the teats. Near these I observed, also, the inguinal cavities, as they are called, which are two bags or folds of the skin, filled with yellow glutinous fat, having a strong odour.

The preparation of the eatable parts of an animal is deemed a woman's business, and it was here done by Daria alone, with great dexterity. She took out the stomach, and when this was emptied and cleansed, she collected in it the animal's blood. This was afterwards heated slowly in the smoke at the fire, and kept as a savoury dish for the rest of the journey. The first stomach was filled completely with coarsely masticated herbage, for the wild sheep live in winter on the tops of the rocks, from which the snow is almost all blown away, and find there frozen vegetation in abundance. We found the young lamb, too, perfectly formed; and it was obvious that the ewe was killed, in spite of the unfavourable circumstances under which she was pursued, in consequence of her being so much heavier than her companions. It had

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now begun to snow much more heavily, and while we were busy in cutting up the meat, the older hunter returned to us with his hardy dog. The latter now devoured his share of the game with the heartiest satisfaction, for he was lean with starvation, and yet he never dared to touch the other pieces of meat that were lying about.

We then returned, with the richly laden rein-deer, to our quarters in the wood. Here a great fire was already blazing, and Fedor had piled up the luggage into a sort of wall towards the wind, by way of protection from the snow-drift, and so we now began to live pleasantly. The Yakutian carrier shouted for joy at the sight of the fresh meat, and cried out in the first moment of his exultation, "I will stay awake the whole night, and eat till we set out." Every one cut for himself some thin wooden skewers, on which he spitted a row of little bits of meat; these were then fixed in a slanting position over the fire, and the slices upon them very nicely broiled. We kept whetting our appetites, preliminarily, with these excellent grills, while Daria filled the iron kettle with snow, and then boiled in it much larger pieces of the argali. But the hunter, in the mean time, did not forget to take the animal's brain to suck it raw, — for that, as he expressed it, is the hunter's perquisite; he also cut out the eyes, and dressed them for himself, as these, too, being particularly well flavoured, are deemed the meed of honour, and are therefore claimed by the hunter.* The flesh of the argali is, altogether, a most excellent meat. It has all the merits of our European venison, but is more succulent, and generally fatter, and it has, besides, an additional flavour,

* I feel convinced that the sheep which inhabit the western side of the Rocky Mountains in America, between the Missouri and Columbia, are of the same species as the Argali. Washington Irving might be supposed to have copied from the latter animal, in the descriptions which he gives of the big-horn or American wild sheep, in his Astoria.

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which closely resembles that of good mutton. It may be distinguished at once, by this flavour, from the flesh of several other animals with which the argali is allied.

I rendered the feast of to-day complete by a present of buck-wheat, sufficient for the whole company. The kettle was put on the fire once more, and, as the pudding began to boil, our Yakut threw, with much solemnity, a portion of it into the fire, till the flames blazed up. This he called an offering for the earth, as Fedor translated it; and it is worthy of remark, that nothing of this kind was ever done in the case of animal food. It seems not unlikely, therefore, that this custom is connected with that decided disinclination for agriculture which has been always manifested by the tribes in this quarter; for, although they constantly see with the Russians many fruits of the earth, and find them palatable, yet they still continue to regard them as foreign and new-fangled. Another religious conviction of the Tunguzes was revealed to me accidentally, also, as we sat here over our watch fire. The drivers had, in the course of the day's journey been singing, at different times, the melancholy airs to which they adapt their improvisations; and, when I now begged them to repeat those songs at the fire, they all answered, with one accord, and with a kind of superstitious awe, "It is a sin to sing at night."

I flayed, also, the lamb of the argali, and for this skin I had to pay, not the hunter, but Daria, for the skins of all young or immature animals are given to the women, as they furnish the softest materials for gloves and caps. We talked over all the details of the hunter's life while the fire was gradually burning down. At length a large log was placed on it, so that some embers might last throughout the night. Every one then covered himself up in his furs, and dreamt over the good luck of the day.

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CHAP. XVIII.

MODE OF STORING PROVISIONS IN THE WOODS.—A SIBERIAN HURRICANE.—SOURCE OF THE BIELAYA.—THE SEVEN RIDGES.—CROSSING THE MOUNTAINS.—THE ALLAKHYUNA.—THE POST-MASTER'S YURT.—THE ANCHA.—BEARS.—YURTS OF ANCHA.—A TUNGUZIAN PRINCE.—ELEVATION OF THE PLACE.—ROCKS.—PLEASURES OF NOMADIC LIFE.—TUNGUZIAN SONG.—PROLONGED TWILIGHT.—KHOINYA.—SUMMER TENTS.—PECULIAR CLIMATE.—LARCH WOODS.

May 4.—WHEN we awoke in the morning, we were covered an inch thick with snow, but became as lively as ever as soon as the fire was stirred up afresh. We breakfasted partly on tea, partly on the meat of the argali. The rein-deer were then caught; and as they had found a good pasture, the lazo was to-day indispensable. While the harnessing and loading were going on, the hunter cut the stem of a fir tree short, and lopped off its lower branches. On that he hung all the meat which remained, covered it round with leafy boughs, and on the top of this little roof he set the figure of a bird, shaped with the knife out of some bits of wood, and made more like by the application of a little charcoal. This he did, as he explained to me, to prevent the crows from pillaging his depôt; for he had made up his mind to leave us, and to go in pursuit of the wild sheep. On such occasions, the hunters who go alone make deposits of this kind in the place to which they mean to return at night. They then take with them, besides the rein-deer which they ride, another also, to carry the produce of the chase, and the deer must not, therefore, be loaded unnecessarily at starting. In the subsequent course of my journey I often saw similar pyramids of meat

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under a covering of fir branches. The meat, in these cases, was but a few feet above the ground, but yet it was high enough, as the Tunguzes assured us, to be quite safe from the foxes, which are very numerous in these forests.

We proceeded to-day constantly on the ice, in the rocky valley of the Bielaya, in which, soon after we started, a true Siberian burán came on, and continued the whole day, with very heavy snow and violent gusts of wind from the east. We rode on slowly and in silence, for every one, wrapped up as closely as possible from the storm, forgot to drive his deer, until we came, about three o'clock in the afternoon, to an empty and tottering yurt, built for the night-shelter of travellers. We had gone over but a small part of the day's march, and I therefore insisted that we should stay only for a short time, to recover from the fatigue which we had endured; but, instead of that, our Yakutian driver unloaded the rein-deer, and turned them into the wood; and then he said to me, in the decided manner peculiar to his race, "Strike me dead, but I will go no further to-day!" In fact the poor wretch was frozen so that his teeth chattered. The cloth frock which he wore in the morning over his leathern summer clothing, he had given to Daria, and the snow water had penetrated to his skin. Thus it appears that the laws of chivalry are acknowledged even by the riders on rein-deer. They were both pleased, moreover, when I rallied the Yakut on account of his tender attentions to the Tunguzian damsel.

We now stopped up the windows of the yurt, through which the storm still kept driving in large quantities of snow, and then we comforted ourselves to the utmost with a large fire. No one heeded the snow water which trickled from the warmed roof and down the walls; on the other hand, the speed with which my companions contrived to-day to kindle a

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fire, deserved not only gratitude, but admiration, for it is hard to conceive how anything which they carried with them could have been kept dry.

Every Tunguze bears in his girdle, for this purpose, a fire-steel, like that of the Buraets, and two separate cases, in which tinder and sulphur are very effectually secured from wet. The case for the tinder is fastened to a thin strap, on which, also, slides the cover of the case, which is made of long-haired skin; but the cover is moveable to so short a distance on the strap, that the precious contents of the case remain perfectly protected while a small portion is taken out. The sulphur, on the other hand, is melted in a cylindrical wooden vessel, half an inch in diameter, and about the same in height, with a small peg at one side, by way of handle. The first chip of wood is then lighted, by placing it, along with the tinder, on the sulphur. On a journey, all these things are secured still further by wrapping them up tight in waterproof leather.

May 5.—The snow still continued to fall, but the air was calm as we rode in the morning further up along the arm of the Bielaya, which we had followed constantly from Garnastakh. To-day we reached its source, and then began to ascend a part of the Aldan mountains, which the Russians very aptly denominate *Semkhrebti*, or the seven ridges.*

Soon after we had left our night's quarters, I found on the river large blocks of stone from the cliffs, which are wider apart here than they are lower down. Silicious earth and iron oxide are now combined with the limestone, of which the rocks hitherto were wholly composed. This limestone resembles a fine-grained sandstone, and is soluble in acids, not to the extent

* The Russian khrebét is connected, both in sense and etymology, with the German grat, in Rückgrat, gebirgsgrat, &c.

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of one-half, yet it lies in beds two inches thick, like the limestone lower down. But in this rock are observed some other more delicate separations, which are inclined to the surfaces of the strata, at an angle of 70°; they are bright grey, and glisten with fine crystals. The surfaces of the strata, on the other hand, are much darker and rougher; they have, also, regular furrows or undulations impressed upon them, in the same direction as those oblique cracks, and only about a third of the thickness of the strata asunder.

Then, again, on the western slope of the Seven Ridges, just where we began to ascend through narrow and irregular watercourses, and to leave the valley of the Bielaya, which ends there, we found a rock formation, like an artificial wall, in smooth steeps of clay slate, the strata of which were inclined steeply to the south west. It is of a bright grey colour with a talcose glisten, and splits into very thin plates, with an undulated surface. Admixtures of lime, which it received before it hardened, are not received into the principal mass, but are always secreted in clefts which cut through the fine stratification. On the other hand, decomposed pyrites occur between the surfaces of the slate, but without changing its texture so decidedly as was done by the limestone.

The Semkhrebti, or Seven Ridges, consist wholly of this rock. They are very properly considered as forming only a single mountain mass, for the gaps which mark out the road, over seven different hills in succession, do not reach by any means so low as the valley of the Bielaya. Their summits were now quite bare, for they rise to a height which the larch does not here attain; but in the valleys between the separate eminences there are thick woods of this tree. The passage over the mountain was slow and difficult, for the snow lay often seven feet deep in the

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narrow gulleys, and our rein-deer sank in many places above the ears. In doubtful places, therefore, it was necessary for one of the drivers to go forward on snow shoes, and whenever he could sink his five-feet staff in the snow without finding a firm bottom, we turned back, and sought another way. In this manner we reached the seventh pass, just as night was setting in, with rein-deer thoroughly tired, and we halted close below it, where the growth of the larch commences. The axe and fire-steel soon made even this spot supportable, and gave us the means of recovering our animation.

May 6.—The rein-deer were collected early in the morning, and we rode from our encampment on the Seven Ridges, again, through snow-covered larch forests. We went steep down to the Allakhyuna, the station on which was often mentioned to me as being one of the most important on the road to Okhotsk. But before we arrived at it we saw in the forest a handsome birch tent erected, and a great herd of rein-deer feeding close by it. It vexed us a little to think that we should have slept on the naked snow in the vicinity of an ample and hospitable roof; and this feeling was increased when the Tunguzes, to whom the tent belonged, told us that they had come here on our account. They were driving the rein-deer employed to carry the post from the station close by, and heard it surmised there, that we should have great difficulty in crossing the mountains, with the same rein-deer, from Garnastakh.

The bed of the Allakhyuna, down which we now rode, is situate in a valley of a kind which appears to occur but once in every separate mountain group. For, as the valley of the Inn, for example, in Tyrol, separates the limestone Alps from gneiss, so this divides the Aldan mountains into two great masses of totally different constitution. The limestone forma-

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tion, which predominates decidedly on the west of the Allakhyuna, and is only once interrupted there by the clay slate on the Seven Ridges, which still contains lime, ceases altogether the moment this river is crossed. Equally remarkable is the form and general look of this valley. It is a chasm, about a mile wide, along the level bottom of which the small river runs in a very winding course. The western wall of the valley seems to be formed only by the Seven Ridges, and some other equally steep and rugged mountains; while through the lateral valleys, which open on the eastern side, may be seen the summits of much higher mountains in the distance.

We staid till the following morning on the right bank of the river, in a wooden yurt built by the Russians, and inhabited, like the similar yurt at the Amga, by a *smotritel*, or superintendent of the post. At this point, too, unite the northern or winter road, by which we had come, and the southern road, which is preferred by the Russians in summer. Here I determined the dip and the intensity of the magnetic force, but was then obliged to take advantage of a few leisure hours, and the convenience of a house with a solid roof, for effecting some repairs in my barometer. I had fastened together some parts of it with glue, and afterwards, during the last nights passed in the snow, I had forgotten how liable it was to be spoiled by moisture. It was all joined anew, and dried, and during the rest of the journey was covered carefully at night. I found the height of the Allakhyuna to be 1906 feet above the sea, consequently about 382 feet higher than Garnastakh, and nearly at the same elevation as the commencement of the valley of the Bielaya, at the western foot of the Seven Ridges.

May 7. — The weather to-day continued fair, for the clouds, in dazzling white, and very elevated

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cumuli, remained over the mountains, without, however, touching them; but over the Allakhyuna and the wider of the side valleys, they disappeared altogether. Thus the sky presented, in a very striking manner, a picture of the country immediately below it.

We took leave next morning of our friends from Garnastakh, without the hope of ever seeing them again, and went on with the drivers and rein-deer who had come yesterday to meet us. We rode at first about three versts southwards on the Allakhyuna, and then up a large tributary stream, which enters it on the left bank from the east. The Tunguzes call it the Ancha, and we now followed the lateral valley embracing it, not only till the evening, but on the following day also.

Near the mouth of this stream, we had to cross over a ridge of hills, the elevation of which I found to be 2340 feet above the sea, or 425 feet above the bottom of the valley. It is covered with thick larch woods, and presents to the valley a steep slope of coal-black colour, and deeply furrowed by snow-water. The rock which forms the sides of this and all the succeeding valleys, is a clay slate, distinguished from that of the Seven Ridges by its darker colour, coarser grain, and thicker strata. Its surface is worn by the weather, partly into small, flattish rubble, partly into black earth, and it is but seldom that large and projecting masses of the same rock are found in the midst of this detritus. These are the heads or summits of the original strata, inclining steeply to the west. All the declivities facing the sun were here already completely cleared of snow, and innumerable rills were murmuring through the gravel, or poured down in broad channels to the river. It was almost manifest to the eye how they continually wore deeper into the rock. Yet, in the bed of the

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Ancha, and to a certain height on the sides of the valley, there is not a trace of the clay slate to be seen, but blocks and boulders of granite lie there piled up, one upon another, and form a wall at the side against the black rubble. Judging from their size, it is just possible that some of these stones may have been swept down the valley of the Ancha from the mountains towards the east, in some recent period; but many of them lie so high on the sides of the valley, that no streams, such as exist here at present, nor any thing but far more powerful, pent-up floods could have borne them hither.

In this valley, the moist and slimy soil, the collected heat, and the protection afforded by the surrounding mountains, are highly favourable to the growth of trees. Land-slips and falls of stones in great quantities have alone laid bare some declivities; but on the left bank, where the ravages of snow-water and their consequences are less felt, all the slopes are covered to the top with larches of singular beauty, and the islands, formed in the middle of the river by the granitic alluvium, are clothed with thick groves of birch, intermingled with tall poplars. Under such circumstances, and in a part of the earth so rich as this is in the forms of plants, there can be no want of serviceable herbs and bushes, and for that reason the valley of the Ancha is a favourite resort of bears. Here, as in other places where these animals remain masters of the wilds, they select for their haunts the most fertile and picturesque spots; and in summer they become so numerous and daring, as to devour any provisions which the traveller may chance to leave outside his tent. In winter, they are scarcely ever met with, and the Tunguzes laughed as I exposed my ignorance of that fact, for "every child must know that the bears are now asleep, and will sleep till the beginning of summer."

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About eight o'clock in the evening, we came to a well-wooded opening in the valley, where the rein-deer began to step out more quickly and vigorously, as they always do on approaching an inhabited place. They then made 2400 paces upon a portion of the road, which our driver estimated at two versts, and at last halted at the wooden yurts of the Ancha, where we staid for the night. This also was built for the use of travellers, and the Tunguzes who dwell in it during the winter, were now living close by, in a very roomy and lofty birch tent already. They had even slaughtered a rein-deer, and the cross-bar, which is fastened between two of the tent-poles to support the kettle, was now loaded with the animal's stomach, in which the blood had been collected. At this season of the year, the fire is still kept burning in the tent from morning till night, and all the provisions, therefore, within it, are soon dried and smoked; they can then be carried about on journeys in summer without spoiling, and the flesh is preferred in this half-raw state without any further cooking.

In the tent at Ancha, there was living at present, among others, the wife of a Tunguzian prince, with her son, a child about eight years of age. She was above the middle size, very slender, and beautifully formed, and, without regard to her rank, took part in all the housewife's labours. She was at present making boots of the skin of the slaughtered rein-deer. The young chief, on the other hand, was treated with particular attention by all the men of the party. They introduced him immediately to my notice, and some time elapsed before I learned that his mother, also, was in the tent. He wore, like several of the men here, the state costume of the Tunguzes, which is covered with a number of metal ornaments, attached, some of them to the girdle which braces the clothes round the hips, and some by means of thin

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chains to a crescent-shaped plate, fixed on the breast for that purpose. I remarked among these appendages, besides the fire-steel and numerous pieces intended merely to rattle, little tweezers also, with which the Tunguzes are in the habit of plucking out the hairs of the scanty beard which grows on the upper lip. The caps, and many parts of their leathern dress, were adorned with silver plates, which had been beaten and cut out of coins. These must have descended by inheritance through many generations, for the introduction of silver money from Russia into Siberia has been long forbidden; perhaps because it was found that, owing to the love of the indigenous races for these ornaments, the coin was withdrawn from circulation. Between the pieces of silver were beads of different colours sewed on the leather. The Russian merchants now carry beads of this kind, under the name of *biser*, to all the markets in Siberia. But the Tunguzes are so strongly attached to this kind of ornament, that it is manifest they must have received it at an earlier period from China.

The snow shades worn here are opaque plates, in which is cut only a narrow, horizontal slit before each eye. This stands at some distance from the cornea, and therefore all the rays which fall beyond the line of vision at each instant, are completely cut off, and those proceeding from the objects looked at are sufficiently subdued. Of these plates, which have an area of perhaps ten square inches, I saw here several which were made of beaten and polished silver, and looked like the vizors of knights' helmets. They have descended, without doubt, from those happy ages when the dauri, or people dwelling on the Amoor, were celebrated for their riches and the abundance of the precious metals which they were supposed to possess; and when the rumour and the hope of inexhaustible mines to be found in that valley, continually influ-

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enced the ardour of Russian adventurers. The conviction was at last obtained that these metals all came from the south, from China, and probably they penetrated, at the same time, further north, to the Tunguzes in this quarter. At present, however, most of the men use, instead of these expensive shades, a piece of yellow birch-bark of the same shape, bound at the edges with thin leather, and then fastened to the ears, as usual, with thongs.

I determined the position of the winter yurt of Ancha by transits of the stars, which I observed this evening. It lies something less than one minute north of the sixty-first parallel of latitude, or nearly one degree more north than St. Petersburg, and as much more south than Yakutsk. It is, at the same time, 2385 feet above the sea, that is to say, as high as the farm-houses on the Oderbrüche, and the Brocken Inn, in the Hartz; in both which situations, the vegetation, owing to the unfavourable conditions attending an isolated mountain mass, is far more poor and dwindled, than it is in this Siberian region, lying 9° further to the north. If the isothermal lines, between Yakutsk and the meridian of this place, coincided with the parallels of latitude, the mean temperature at Ancha would be no more than —7°·9 R. Yet the luxuriant vegetation on the islands which we saw to-day, and the tall poplars which cover them, are clear proofs of a milder climate, and therefore the isothermal lines do not stretch directly eastwards from the Lena, but must incline much to the north.

May 8.—The Tunguzes had been only waiting, as they told us, for the arrival of "the star finder," before they commenced their summer wanderings for this year, and even this very night a young married couple had set off, with a tent and ten rein-deer, on the road which we were about to travel. They were this year making an independent journey for the first

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time, and some of the men who were now accompanying us, were to join them hereafter.

Here they gave us fine, vigorous, and active reindeer, all males, as was evident from the beard-like mane under the neck. The females were now exempt from hard work, as the fawning season was at hand. It was necessary, therefore, to ride with shorter reins, and Fedor and myself, at the very outset of our journey to-day, were flung to a great distance on the ground, because we neglected that precaution. As we proceeded, however, without disturbance, we met with no more of these accidents, and I now learned even to strike fire in the Tunguzian saddle, to smoke, and at times, when it was necessary, to write a few words with the pencil. The muscular power of the rein-deer is not felt until he breaks suddenly from the pace prescribed to him, and bounds along unrestrained. This took place to-day, in consequence of the animal which I was riding being frightened by my dog, for the latter, being left behind for a short time in Ancha, leaped upon me suddenly, out of joy, when he overtook us.

In the middle of the wood, and at no great distance from the yurt of Ancha, I found the grave of a Tunguze. It was a chest formed of logs, about six feet long, projecting, like a sarcophagus, about four feet above the ground, and filled to the top with earth. Here, also, as in the similar graves of the Tatars of Kasan, the upper end of the coffin, which is marked with a cross, was turned to the east. The Tunguzes, it must be remarked, bury their dead at the place where each expires, so that we were often reminded in the Aldan mountains of the monuments raised over those who have perished by accident in the Tyrolese Alps.

We then rode on again close to the river, at the foot of the mountains confining it. Here, again, the

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slopes on the right bank were already free from snow, and their slanting, even surfaces were strewed over with the weather-worn and disintegrated fragments of a black rock; on the left bank, the declivities were completely covered with snow. On the islands were poplars of such fine growth, that they even exceeded in height the larches close by. Some other kinds of trees with expansive leaves in these clusters, are distinguishable by their forms, and may possibly be alders.

The sides of the valley here are formed of a massive and obscurely-stratified rock, which looks like hornstone or silicious slate. It is very black, and so dense and hard that the fragments of it acquire a shining and polished surface, when they have rubbed one against another in the river. One would hardly suppose it to be a rock owing its origin to water, or of sedimentary formation, yet its looks must have been changed by influences of later date, for I found in it this day some impressions of plants, imperfect, yet not to be mistaken, as if of the striped stem of an equisetum. But on the slopes of the islands facing the east, there is still nothing to be seen but granite blocks heaped one upon the other. The granite, neither coarse nor fine in grain, contains bright yellow feldspath, black mica, with a few and very small crystals of hornblend. As the size and frequency of these masses increased regularly the further we rode upwards, it might have been conjectured that we should reach their starting-point and the source of the river to-day at the same time; yet this was by no means the case. The place whence they came lies far beyond the secondary water-bounds, which we did not pass over till the following day, and therefore they must have been carried hither by some means quite unconnected with the waters as they flow at present.

We came, about eight o'clock in the evening, to a considerable lake, from which the Ancha takes its rise,

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and which the Tunguzes call Tungor. It lies in an expansion of the valley, which ends here, and is encircled on the south and east by abrupt crags, overgrown with moss. Rein-deer find good pasture in this place, and for that reason the hunter from the yurts of Ancha had pitched his tent on the slope. He gave us a friendly welcome, and we remained together during the night, after our rein-deer had been unloaded and turned loose.

It now struck me that the Tunguzes must be seen in a wanderer's dwelling such as this, in order that the agreeableness of the nomadic manners and habitations may be justly appreciated. Perhaps this impression was increased to-day by the circumstance that all the property of our young host was quite new, and had therefore a more pleasing appearance. Before the tent lay the saddles of the rein-deer, and close to them, in two rows, twenty saddle-bags of white glazed leather, filled with provisions; with these were the cooking utensils, some hunting gear, and instruments for preparing leather. In the middle of the tent hung the kettle over the fire, and round its sides our beds were prepared by spreading twigs, and then skins, over the snow. The proprietors had their bed opposite to the tent door, on a coverlet of coloured leather, which was prettily adorned with silver plates and beads of different colours.

I saw here, also, in the nomade's tent, several productions of refined metallurgic art, exclusive of the ornaments which the Tunguzes fasten to the girdle, to the hair, and the plate which they wear on the breast. I remember, in particular, an iron instrument, which they told me was used in dressing leather. It was formed like a rule, one arm of which was two feet long, and the other had a length of five feet, including a wooden point, which prolonged it. But parallel with the edges of the iron, and on its broader

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surfaces, there were two rows of short stripes of silver all round, and between them a row of crosses, formed uniformly of white and red copper. The notches in the iron, through which these bright metals had been sunk, were extremely neat and regular. These articles, it was evident, had not been made by the owners of the rein-deer, but by their brethren in the mountains of Nerchinsk, or of the Chinese frontier, and at the time when the barter between the workers in metal and the hunters extended to the Icy Sea. The silver utensils which the Ostyaks possessed, anterior to the arrival of the Russians among them, can be accounted for only by supposing the existence of such a commerce, respecting which we have also the direct testimony of contemporaneous geographers and travellers.

Some currying tools of a more usual description, and, therefore, probably made by the owners themselves, were far less elaborately wrought than those just mentioned. Among them were a pressing-iron, slightly arched, with teeth at its concave margin, and with its convex side set in wood; and a ring an inch wide, ground to a cutting edge all round, and fastened with leather to a wooden handle. The latter was intended for peeling off the hair, and smoothing the rein-deer skins; the other instrument, for paring them thinner. In some yurts, I saw, for the same purpose, a block of hard wood, in the upper surface of which were cut parallel furrows.

Our host had killed some snow-white hares on his way, and he now showed us their skins. Nothing remained of their flesh, and the evening meal served to-day consisted of dried and finely-sliced salmon, mixed with roe, the grains of which were as large as peas, and looked like amber. The Tunguzes of the mountains obtain this article of food, — with which several of the provision-bags here were filled, — in

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exchange for fur clothing and rein-deer flesh, from their fellow-countrymen on the Okhota and other rivers towards the east. Many of the hunters, also, leave their rein-deer the whole summer under the care of friends in the more elevated mountains towards the north, and go with their families into the eastern country near the sea; for, while the migratory fish are ascending the rivers, the catching of them is an easier and more productive occupation than hunting.

Among our drivers to-day were some who understood Yakutian, so that when I asked a question in Russian I could, with Fedor's aid, get a satisfactory answer. These conversations prove, after a little use, very agreeable and entertaining; and one may conciliate the good-will of the Tunguzes, at the same time, by showing some attention to their language, and by applying opportunely the few words which may have been picked up. In this way, I learned a verse of one of the songs which I had heard of in Garnastakh. As I wrote it down, the Tunguzes made me read it over to them frequently, and corrected every faulty expression. As to the contents of the song, all that I could learn to-day was, that it is sung by all the women here in memory of a Tunguzian maid, who had fallen in love with a Russian; and, indeed, some of the particulars of this interesting story, which was afterwards related to me more distinctly, might be conjectured from certain Russian words occurring in the song, as, *Kontora Kapitan*, *górod* and *Kompasatz* (the compass!). The ends of the verses were regularly marked by the Tunguzes, with a great fall of the voice and a short pause. It was all sung in one and the same fundamental note, in slow, solemn time, and so that equal stress was laid on every syllable.

May 9. — In the morning, the catching of our rein-deer lasted much longer than usual. It appeared

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that one of them, which had been but lately bridled and broken in to labour, was chased in vain for half an hour. A Tunguze, with the lazo, mounted another rein-deer, and rode with great skill in full gallop; the pursued deer, however, though encumbered with a log suspended to his neck, contrived to escape the lazo every time by jumping on one side. At last, when he was well tired, he was taken in a wide noose, laid flat on the ground, and the ends of which were held by two men. He was driven about slowly till he came within the noose, which was immediately drawn tight round his legs. He breathed short and bled from the nose, but was, nevertheless, bridled and loaded with the rest.

Our host, in the meantime, had taken down his tent, and had gone off with his wife and his rein-deer across the mountain, on the eastern side of Lake Tungor. We soon overtook him, however, for the road was growing constantly more difficult, and then rode with him through an extremely hilly tract. The snow was often so deep that the rein-deer sank to their bellies, and the leading rider was obliged, therefore, to go forward on snow-shoes and examine the ground with his staff. The most difficult parts in this respect were some gorges lying at a great height, and some circular hollows on the eastern side of the mountains which we were crossing; for our route to-day was not marked out by the course of any river, and it was impossible not to admire the local knowledge of the Tunguzes as they led us over unfrequented passes, and often through thick forests, from one valley to another.

On the slope towards the sea I found, for the first time, a remarkable rock, which continues from this place for many days' journey eastward, as constant as the limestone between the Bielaya and the Allakh-yuna. It forms acute angled crags, which are divided

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by the strata falling rapidly to the west, and by other regular clefts, into rhombic slabs. Here it had a fine splinter, and seemed nearly homogeneous; yet, on closer inspection, there could be seen in it extremely small crystals of feldspath, and still smaller black points of hornblend. When fresh broken it is always bright grey, and it is only near the surface that the action of the air gives it a reddish yellow hue. It gives lively sparks with the steel, and is so brittle that the slabs ring under the hammer like bell-metal. This is, in fact, the rock which is in other places called clink-stone; for, like this, it is decomposable for the most part in acids, and melts easily to a white opaque glass. If it were not for the vicinity of the black slate, and the stratification which may be recognised with tolerable distinctness even in this rock, we might here suppose ourselves to be in the middle of a primitive formation or in a volcanic district, for the mountains are as rugged and abrupt as they could be in such situations.

We saw to-day again in the thick larch forests a number of ptarmigans (*Tetrao lagopus*), and our hunter was eagerly intent on shooting them. It would be thought a strange sight in Europe if a sportsman were to take the field mounted on a deer, and yet we saw this succeed completely with our comrade. He rode, as is usual in such cases, on a young and swift rein-deer, and led another after him to carry the game. He left to his wife the care of the heavily laden part of the herd, and was thus enabled to follow any game that came in view, and to ride up close to it. He then dismounted, and fired either kneeling or sitting, because it is impossible to stand steadily here without snow-shoes. His rein-deer stayed close by him, and were not frightened, either by the flash or the report of the gun. Here, the people are accustomed to reckon on a remarkable degree of dulness

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or disregard of danger on the part of birds; and I saw a ptarmigan sit unmoved on a low tree, while the gun levelled at it missed fire eight times running. The sportsman, squatted in the snow, displayed equal coolness, and killed his game at last, after priming repeatedly and hammering the edge of his worn-out flint.

About eight o'clock in the evening, or about a quarter of an hour before sunset, we came to an elevated pass where all the rocks consisted of the formation above described. They were stratified and split, just as we had seen in the morning. We were now also encircled by such a number of separate rocky summits, with smooth sides running up to a point, that the mountain, viewed altogether, looked as much cleft and riven as its several parts. The barometer had here fallen so as to indicate a height of 1222 feet above the level of our bivouac at the end of the valley of the Ancha, and of 3660 feet above the sea. Still there were plenty of larches around, and yet we were now 1170 feet higher than the upper limit of this tree's growth on the Ulag-chan, near Garnastakh. But we were hardly half a degree further south than that mountain. There could be no doubt, therefore, that the circumstances of temperature were far more favourable here, under the same parallel of latitude, than in the western half of the Aldan mountains. But it did not appear as if trees could flourish, even here, much higher up than the place where we were standing, for the northern slopes of some mountains close by were already quite bare, and the larches around us were further asunder, and had more of the appearance of slow growth than those in the woods below. But this tree never takes the stunted character of the knee-timber of our German forests, for though it loses its lower branches, it retains at the same time a tapering, straight trunk. Wherever the situation is very cold, the tree looks

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more sharp-pointed and conical than when it grows under more favourable circumstances.

In the neighbourhood of Lake Tungor, and in other places on this day's journey, I saw dwarf birches, which were even now perfectly recognisable by the circular form and rounded indentation of the small leaves, which they retained from last year. This tree, which in the north of Europe is thought to be the most enduring of all, here seems to feel the cold air of the mountains more sensibly than the larch. It disappeared entirely from the passes, and was not found again till we had descended to where the larch attains the greatest beauty. Further on willows appeared in the wet hollows, and then, in a wider valley, tall poplars like those on the Ancha. These leaf-trees gave us to-day, for the first time, a proof that this year's ascent of the sap had already commenced; for whenever we came near to a thicket of willows or poplars, we found the air perfumed with the sweet exhalation of their buds, and these first symptoms of the spring were doubly delightful when all around was still covered with snow.

We were to halt for the night at a distance of only eight versts from the highest part of the road, but we did not reach the spot intended till eleven o'clock at night, after a three hour's ride. Yet, at our arrival, it was so light that distant objects were distinctly visible. The twilight here at this time (in May) continues all night, and was at midnight as strong as it is in Berlin for example, at 10h. 38m., on the longest day. Towards the close of our laborious day's march, we came to an arm of a river which the Tunguzes called Anchikan or Khoinya. This last name they gave also to a log-built yurt, to which our way went again up a steep acclivity. The yurt lay beyond a thick wood. We knew, however, that we were approaching it, though we did not see it, for the

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rein-deer began to quicken their pace. The joy of the Tunguzes now broke out loudly. They raised a kind of cry, which was answered from the yurt. These calls from both sides were modulated in the same way, as the calls of the herdsmen in the European Alps on similar occasions. Our companions called out in particular, and with much emphasis, the words "*debdàk omuléi!*" and "*oldak omulei!*" that is, "give us to eat," and "give us to drink."

The Tunguzes here were now living, like those of Ancha, in their summer tents in the middle of the thicket. We found the yurt on the border of the wood, therefore, without a fire, but in front of it were some young men, who came to make inquiry as to the number of rein-deer wanted. From them I learned that their place of habitation is also called *Kapitanskyi Sàsyek;* that is, "the princely barricado of the wood," or Prince-fort. It must be observed, that the word kapitan is now used by the Tunguzes, and, consequently, by the Russians also, who maintain an intercourse with them, to denote a nobleman or prince. Perhaps they have in their original language, and in Turkish also, a word which resembles this European title.

A few days ago I was observing on the Ancha — what, indeed, had often struck me in other parts of Siberia — to what a rare and remarkable degree the vegetation seemed to be wholly independent of the mean temperature of the place; for I found the trees growing there far more luxuriantly than they do in Germany in places at the same height, and enjoying a much warmer climate. The same observation applies with still more force to the site of our present encampment. It lies 3290 feet above the sea, and, consequently, hardly 425 feet lower than the summit of the Brocken, while it is at the same time 9° further north; and under a meridian which, though

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it be not, like that of Yakutsk, the coldest in the eastern hemisphere, is yet, unquestionably, far colder than any European meridian; yet Khoinya or Kapitanskyi Sàsyek is encircled by a thick wood of tall larches. If we were to look through Europe for something of the same kind, we should, perhaps, find the most perfect counterparts of these woods in the larch forests on the mountains of the Grisons and the Valais. These are never higher than 7500 feet above the sea, where the mean temperature, according to the distribution of heat in that climate, is from $+\frac{1}{2}$ to $+1°$ R. The woods here, therefore, supposing them transferred to the meridian of Yakutsk, flourish with a mean temperature lower by 10° than is necessary for those of the same species in Europe; that is to say, with —9°·4 R. Only a very inconsiderable portion of this great and striking difference between the highest European and highest Asiatic sites of the same plant, can be explained away as merely apparent, by the fact that the isothermals between the Lena and the sea of Okhotsk bend rapidly to the north; there still remains enough to establish the principle, that many arborescent plants require, as the condition of thriving, only the summer heat and the humidity of the air that suits them; and, that they are, therefore, not only quite insensible to the rigour of winter, but, in spreading over the plains and mountains of the earth, are *wholly independent of the temperature of the ground or mean temperature.* Among the trees of the pine kind, this is especially true of the larch, and, evidently, because this tree shoots out anew every year, but in autumn loses with its old leaves its sensibility to the cold. Throughout the north of Asia it is obviously distributed in the same manner as the cultivation of the *Cerealia* and other true summer plants. It is true, that at Kapitanskyi Sàsyek tillage has never been attempted, because no Russians have ever settled

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there; but it cannot be doubted, that it would, if tried, remunerate to some extent, since we find that crops are reaped every year not only at Yakutsk (with a ground-temperature of —6°) and at Amginsk, but also at the station of Omekonsk, on one of the sources of the Indigirka, where the road, from Yakutsk to the settlements at Koluimsk, leads over the high ground. The place just mentioned lies still more to the east than this yurt, and about 2° further north, surrounded by high mountains, and doubtless, also, at a considerable height.

The family of the kapitan of Khoinya is one of the richest among the Tunguzes of the Aldan. They possess numerous herds of rein-deer, which find good pasture here at all times of the year; there is also plenty of wild rein-deer and other game, in the forest round about. It is owing, perhaps, to this favourable situation, that the Tunguzes at this place seem more inclined to a settled and sedentary life than the rest of their countrymen, for I was questioned here, for the first time, respecting *my home*. I was also asked to give an account of *my own yurt*, and to state how far it was from theirs.

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CHAP. XIX.

THE ICE LAKE. — MOUNT KAPITAN. — HEIGHT OF THE PASS. — THE PROSPECT. — MINERALS. — CRY OF HARES. — ENCAMPMENT ON THE SNOW. — CHEERFULNESS OF THE TUNGUZES. — LIVELY LOOKS. — LOVE OF ORNAMENT. — YUDOMSK. — SUMMER CLOTHING. — RELIGIOUS OPINIONS. — DANCE. — THE FIRST APPEARANCE OF WILD GEESE. — TRACES OF CONFLAGRATION. — KETANDA. — FINELY CRYSTALLISED SNOW. — THE OKHOTA. — CHANGED APPEARANCE OF NATURE. — A FISH-SKIN TENT. — CLATTERING TREAD OF REINDEER.

May 10. — WITH a clear sky, the temperature of the air rose to-day, even here in Khoinya, at an elevation exceeding 3190 feet, to +5° R., and thus were explained those beginnings of vegetable life which we had taken notice of yesterday in the valleys lower down.

It was noon before we were ready to proceed, and then we rode, with new drivers and rein-deer, at first up a steep and snowless acclivity. It was covered with slabs of the grey clinkstone, and we came again on complete strata of this rock as soon as we reached the ridge of the mountain, about 300 feet above Khoinya. There, with great surprise, we found ourselves at once about to begin a new descent, and saw, deep below us, a round, white plain, enclosed on all sides by rocky steeps. The ridge on which we stood was about 500 feet above the plain; but the hill on the opposite side of this remarkable hollow, rose to perhaps double that height from the ground in the centre. We now rode down into the basin, and found it to be nearly circular, about two versts in diameter, and manifestly horizontal. It was at present covered completely

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with this year's snow, and frozen hard. But under this covering lay a thick stratum of ice, which never thaws, even in summer, and assumes in that season, as the Tunguzes of Khoinya assured me, the appearance of a calm lake solidified. They call it the Kapitan's lake; but the Yakuts, who travel over it only in summer, give it the name of *Buskiöl*, or Ice-lake; and the Russian traders that of *Nákipnoi lyöd*, that is, the Spring ice, or literally, *the springing ice*. There are, in this most elevated part of the mountain, two other similar places; and the traders speak, too, of a fourth lake of ice near which they pass on the summer-route to Okhotsk; but, from what was subsequently told me of its situation, this seems to be no other than Lake Tungor, on the side of which we spent the night with the hunter of Ancha.

On the steep slopes around us, there lay, though it was now winter, but very little snow; they were, for the most part, quite naked, and the mass of ice on which we stood, was nowhere prolonged to any of the mountain tops; it had, therefore, neither the look nor the internal character of a glacier in the Alps, for in these the connection with the perpetual snow at the summit of the mountain, is always visible. It is only by such a connection that the origin and subsistence of the ice can be explained, with its progressive motion, and its deep cracks filled with water, of which phenomena there is no example in the Aldan mountains. Here, on the other hand, are formed deposits of ice, like that of the Kapitan's lake, wherever there is a plain at a great elevation, completely surrounded by mountains, particularly towards the sun, for the snow, which is completely blown away from the exposed summits, necessarily accumulates in the sheltered plain. The bottom is at the same time shaded, and the warmed air can never reach it from above, because it is specifically lighter than that which is in

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contact with the snow. It remains constantly, therefore, at its mean temperature; that is to say, considerably below the freezing point, and must not only retain the winter's snow, in the warmest time of the year, but also turn all the rain which reaches it, into ice. But when so cold a mass has once attained a great magnitude, then it is possible that it may congeal, as Russian travellers maintain of this lake, even the spring-water which issues from the rocks below; and, undoubtedly, there are in Tungor, from which the Ancha takes its rise, some subterranean tributaries of this kind. It was a similar state of things which the Samoyedes described to me as existing in the mountains of Obdorsk, under the polar circle; for there, too, all the snow is blown from the tops of the mountains into the narrow glens and recesses, and in spite of the low temperature, it is in these alone that ice is found in summer. Such cold valleys, with glacier-like floors, are there much prized and often sought after, because it is only on the ice that, in the heat of summer, the tame as well as wild rein-deer are secure from the torment of flies.

In leaving this ice-valley, we ascended a snowless, rocky mountain, on its eastern side. The Tunguzes call it Kapitan, or Mount Kapitan, and consider it, no doubt with justice, as the highest in their district. In ascending it we saw, at the east, on our left, perpendicular slabs of rock, more than 100 feet high. These were strata heaved up and striking to the N. N. E., yet portions of it appeared to be split asunder from the base up. About three o'clock in the afternoon we came at last to a level pass, which I determined to be 4200 feet above the sea. Here the reindeer were allowed a few hours' rest, and in the mean time I enjoyed the prospect, which was so magnificent that I set down this point as the handsomest in the Aldan mountains. Between north and west, there

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rose above the plain a bold front of crags at no great distance, which form in strictness the summit of Kapitan, and have an elevation exceeding 4250 feet. Their only vegetation is rein-deer moss and other lichens; but at the elevation of 4200 feet, I had still been able to suspend the barometer from a larch tree. Around us were now many larches, wider apart indeed than in the woods below, but still with tall and well grown stems, and the ground near these trees was covered with heath plants.

Quite different from this, and too peculiar to be easily effaced from the memory, was the prospect towards the quarter of the horizon between south and east, opposite to the highest rock of Kapitan. In that direction one looks steep down from the plain, and between mountains torn asunder so roughly, that they can be compared only to the waves of a violently agitated sea. Their remoter parts seem to form three parallel chains, striking N. N. E., with a level ridge; but between the nearest of these chains and the mountains on which we stood, were a number of round valleys, like that on its western side, and the mountain sides presented rocky surfaces so smooth, that their freedom from snow appeared attributable solely to this cause. Indeed, the snow formed but a few bright streaks on them, and between these were to be seen only the bright grey rock, or a yellowish covering of lichens. Thus, not only the singular form of the valleys, but the uniform colouring and distribution of light in the landscape, recalled to mind the view of the moon in a powerful telescope. All these mountains were so evidently connected with the Kapitan, and harmonised so completely with each other in form, that it was obvious they consisted all of the same rock which we had met with from Tungor to this p ace. In the south-east only, the furthest of the chains was divided by a broad gap, and in the opening

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thus made to the horizon, was to be seen a much remoter ridge, wholly unconnected with the group of the Kapitan, and manifestly of a totally different geognostic character. It was divided, like a saw, into a number of summits united only in their lower halves. But again beyond this furthest chain in the east, at an equal interval, was another smaller group, consisting of two separate and perfectly conical peaks.

I had found the rock at various points of this remarkable pass to be of the same constitution as that met with on our journey hitherto; yet I did not omit to examine some narrow strata which projected in lines from the plain, owing to their having withstood the action of air and moisture. I saw, with feelings akin to amazement, that they were filled with rounded stones, varying from the smallest size to that of a pullet's egg, for the crystalline texture which we had hitherto observed in this rock would never have led us to expect such proofs of its Neptunian origin. It now became evident that it was a true greywacke, with extremely fine silicious cement, for nothing but pure quartz had found its way into the fragmentary strata from the surrounding clinkstone-like mass. Among the rounded stones I found some pieces of black schistose hornquartz; but they consisted for the most part of the same granite which we had seen scattered about on the Ancha, in much larger pieces. Of its original position there was no trace, and it would seem as if in the course of the revolutions which the Aldan mountains have undergone, all their granitic rocks were utterly destroyed, with the exception of those fragments which were scattered about at the same period, or taken up like strata, and cemented between other rocks.

The sky over the Kapitan was perfectly clear, and of a dark blue. Towards the south-west, only, were some cumuli, in the horizontal plain of our eye, and,

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consequently, more than 4250 feet above the sea. The temperature of the air, about 3h. 25m. in the afternoon was here only +7° R. We had ascended only 728 feet between the two places, and yet the observed decrease of heat amounted to more than 4° R., instead of 1° R., as might have been expected from ample and well-known experiments on this subject. The cause of this anomaly was obviously a strong west wind, which had sprung up within the last hour or two; for they are always streams from the west which here lower the temperature below the mean, because, like the east winds in Europe, they proceed from the cold middle of the continent.

From this highest point of our route we rode till nine o'clock at night, first downwards in a longitudinal valley, the bottom of which is about 3188 feet above the sea, and then through several narrow dells and over woody ridges, in one of which we spent the night. Here, too, the valleys were inclosed by smooth declivities of the stratified grey rock, and yet granite drift lay at the side of the frozen rivulet on which we were riding. There were pieces of it as big as a man's head.

In the woods, the geognostical puzzle gave way to a zoological question. The hoarse, piping cry which I had remarked, first at Nokhinsk, and afterwards in the woods between Tungor and Khoinya, was now heard on all sides with unusual animation, and I learned from my attendants that the cry in question is uttered by the hares in this country, which are thus widely distinguished from their dumb congeners in Europe.* In obtaining this information, I was obliged to rectify a curious misconception; for my Kosak, as a genuine Yakutsker, had never heard the word saetz, the

* It is the *Lepus Alpinus*, Pallas.—Fauna Rossica, i. p. 150.

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Europeo-Russian name for a hare; and he was, at first, as unintelligible to me as I was to him, when he spoke to me of "the well-known devil's-dog, which gives a good white fur, and the flesh of which is an abomination to true believers." * We understood each other at last, when he said, "They mean the animal the skin of which we saw with the hunter of Ancha, in the tent on the Tungor.

We halted to-day, again, on the deep snow in an opening of the wood, so that we had the clouds for a roof. It snowed without intermission in the evening and during the night, yet every one felt satisfied and cheerful, owing to the clever management of the Tunguzes. The moment they alight at a halting-place they unload the rein-deer, and lay the saddles and luggage together in good order; the bridles, too, are collected, and hung up on the bough of a tree. In a few minutes the hungry herd disappears in the forest, and a feeling of loneliness then takes possession of the traveller.† The men who went out with the axe now drag two large stems of larch to the encampment. The small twigs are cut off, and gathered on the snow (which is cleared away roughly from the fireplace alone) to serve for straw. They then cut from the inside of the thick trunk, some resinous and dry chips, and soon light them with their tinder and sulphur. The lighted chips, with some others, are well wrapped up in twigs or brushwood, and fanned

* The Russo-Greek Church has adopted, from the Jews, this and every other prejudice against certain kinds of animals. "And the hare, because he cheweth the cud, but divideth not the hoof, he is unclean unto you." (Levit. xi. 6.) The more devout Russians go beyond the letter of the law, and object to many articles of food from whimsical scruples. The Russians on the coasts of Kamchatka and the Aleutian Islands find, in the lawfulness of eating the seal and the whale, a constant theme of argument.

† It is the eye alone which perceives this want of motion and life, for the rein-deer are quite mute, and on the snow their step is noiseless.

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with great quickness and dexterity through the air until a flame bursts out sufficient to kindle the log which lies ready for it. The kettle is filled with snow, and hung from a strong branch, which, fixed in the ground on the windward side, leans obliquely over the fire. All this is done in a few minutes, for the Tunguzes proceed in exactly the same order every evening, and their habitual activity seems to be increased on these occasions, and to be guided effectively by some involuntary impulse.

To-day a spade, or shovel, was used to clear away the snow from the fire-place, and to fill the kettle, so that I had occasion to observe the intelligence with which the Tunguzes manage utensils of that kind. They fasten a strap to the lower end of the shovel, which bears the load, and raise this with the left hand, holding the handle with the right. Thus the sustaining power acts immediately on the load, which is not liable to be multiplied, as it is in the use of the European spade, by the unfavourable position of the hand. The Tunguzian shovel is nothing more than a board, about three feet long, which is generally cut small at the upper part, while the lower end, to which the strap is attached, is nine inches wide.

Our drivers then made seats and sleeping places with the collected twigs and the rein-deer saddles, and for me, with the Tuphyàk, or Tatar cushions, which each of us carried rolled up under his luggage. We then set ourselves close to the fire, and took no further notice of the falling snow, for the warm current of air melted it, or carried the flakes away. Thus we took our supper in the best possible humour, and amused ourselves with watching the flames, the gleam of which fell sometimes on gigantic logs, sometimes on dazzling heaps of snow. The Tunguzes showed themselves here, as elsewhere, extremely

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agreeable by their wit and sprightliness. Unlike the other Siberian races, they are always inclined to laugh, and, on every topic, seize readily the point of view that suits their humour. To-day, they admitted fully the advantages of the art of writing, as I read to them from my journal some Tunguzian words which I had learned on previous occasions. But they were particularly taken with a playful turn which accident gave to this occupation; for, as we read the word *khodya*, which signifies to dance, it came into my head to connect it with a subject, making with it either a literal or figurative sense. It was remarkable how quickly and keenly the Tunguzes entered into my views. The first who divined my meaning explained it to the others with loud applause. They then amused themselves with giving different turns to the expression, and repeated with comic solemnity, and as if they were the words of a song, the phrases, "The Tunguzes dance, the rein-deer dance, the stars, the snow, the fire, the fox, the squirrel, &c. dance!"

After so auspicious an introduction, I took care to mention the ballad which we had learned in our encampment at Tungor, and it was to be seen immediately that this was known, and was a favourite here also. As I read it over, my hearers repeated each verse with joyful amazement, and it was not till I had finished that one of them said to the Kosak, in Yakutian, that a part of it required some change, and he furnished, at once, the necessary corrections.

It was evidently to this ballad that the old woman in Garnastakh alluded, when she said that we should learn it more fully and completely from the women in the east, for here, too, it was agreed that the text which I brought from Ancha was defective rather than false. They rarely found fault with an expression, but often said that words were omitted.

Unfortunately, I was unable to get a literal trans-

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lation of this ballad, for our attendant, after explaining the last line, added, "The rest cannot be translated into Yakutian;" which may possibly have been true enough, considering his imperfect acquaintance with this language. I obtained, however, in reply to numerous questions, the following information respecting its origin and general purport. It is now in the mouths of all the women, but was sung, in the first instance, by a Tunguzian maid, who had fallen in love with a *Kontora Kapitan*, that is, an officer or clerk in the counting-house of the American Trading Company. He had, at first, responded to her attachment, but afterwards refused to take her with him; and both these circumstances are stated in the song. Probably the Russian who has thus acquired so unexpected and undeserved a celebrity, was the master of a ship, and the girl one of the coast Tunguzes, for it is said in the song, "Let me look once more at the compass." The deserted damsel afterwards lived in the town, as my companions related, and married a gypsy who was banished from Russia to Okhotsk. To my question respecting the time when all this happened, one cried out, "Very long ago;" while others maintained that the poetess might perhaps still be found in Okhotsk.*

The gay and poetical disposition of the Tunguzes is shown in the grace and agreeableness of their outward appearance, which I could not help feeling and admiring more and more every day that I travelled, and every night that I chatted with them on the snow. They realise, in this respect, all that has been said by our poets and older historians of the gypsies;

* They were obviously the younger and less experienced men who inferred that the tradition was of recent origin because it was still in vogue. But in Okhotsk I inquired to no purpose after the authoress of the ballad, which was wholly unknown to the Russians, although many of them had ample opportunity of learning it in their journeys over the Aldan mountains.

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and, indeed, it would be pardonable in a European traveller, if on account of that resemblance alone, he were tempted to believe in an original affinity between the Tunguzes and that very remarkable race. With the former, the charm of their look lies in their slim and active figure, as also in their constant connection with one of the handsomest of animals; for when one sees a Tunguze sit, with the proudest deportment, on his rein-deer, they both seem made for each other, and it is hard to decide whether the rein-deer lends grace to the rider or borrows it from him.

But the Tunguzes take much pains, also, to enhance their natural beauty by the aid of art, and they adorn in the most careful manner all parts of their dress. They remind us, in this respect, of the love of ornament for which the Chinese are so famed. The upper garment of the men, like an old-fashioned English hunting coat, is open in front, and has broad tails, which, in riding, hang down the sides of the rein-deer. It is made of rein-deer skin. The leathern side, which is turned out, is dyed yellow, and the tails are richly embroidered with blue and red threads and beads. Still more striking are the pretty wristbands, or mittens, of the finest leather, which are fastened below the sleeves of this coat. They fit tight round the wrist, cover the back of the hand, and reach with a pointed flap, which is cut on the border into concave arches, in Gothic style, to the lower joint of the middle finger. They are ornamented with embroidery and needlework, and are obviously intended to conceal, in a pleasing manner, the broader and less handsome part of the hand. The fingers receive from this covering a more agile and delicate appearance, and I was often surprised to see how vigorously our companions, who wore this piece of dress could handle the wood-axe. Some wear, by day, a veil of coloured silk, which is sewed to the lower edge of their snow-

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shades, and reaches down to the chin. It protects from the injurious effects of the snow light, for this reddens and swells the face to a much greater degree than the direct rays of the sun in summer.

Our conversations with the Tunguzes were continued to-day, on the journey; and one of them with whom I rode forward alone, interpreted my imperfect attempts to explain myself so sagaciously, that we began to make ourselves mutually understood without an interpreter. Thus I learned from him that the Tunguzes call the elk *toki*, although he was not acquainted with the Russian names (*los* and *sakhatá*) of this animal. He guessed my meaning, and was overjoyed at so doing, after I had several times repeated the words, "A great rein-deer, with horns like a shovel!"

We travelled, to-day, only till four o'clock, and came, first, to a gently inclined tract, through thick larch forests and across a small stream, and then over several ridges, one after the other, which we crossed, in some cases with difficulty. They form the second of the mountain chains which we had seen from the Kapitan before us in the east; and now that we were close to them, they exhibited the same remarkable smoothness and evenness of the rocky faces which we had recognised in them at a distance, and had observed on all the mountains from Tungor to Kapitan. The eastern sides are here steeper than the western; they also exhibit more naked rock. After repeated ascents, we had again nearly attained the height of the Kapitan, for it was obvious, from the growth and the thinness of the larches, that we were close to their upper limit, or 4040 feet above the sea; and yet we came, in only one hour, to the elevation of 2480 feet, at the yurt in which we stayed till the next morning. The descent on which the road lies is everywhere very steep, but there is, besides, in one place, a step,

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or sudden fall of about thirty feet, on a face of naked and nearly precipitous rock. We could not avoid this by any circuit; we were obliged, therefore, to unload the heavy parts of our luggage, and lower them with ropes; the rein-deer then scrambled like goats down the smooth rock.

The yurt of Yúdomsk, as our new resting-place is called, is situate at the foot of this mountain, in a noble grove of tall poplars, and on the right bank of the river Yúdoma. This, when approached from the east, is totally concealed by the wood; and yet its vicinity may be conjectured, for in these quarters the tall leaf-wood is an infallible indication of running waters, and the regular alternation of these with the larches on the heights contributes much towards the peculiar charm of the Aldanian landscape.

We were received by the Tunguzes here with a certain degree of pomp, for the two young wives of the master of the house were dressed in full state costume, and came to meet us before the door, to give the hand to each. They wore summer clothes of very thin, bright yellow leather, which were worked on the breast and shoulders with red and blue threads, resembling, in this kind of ornament, the nettle-dress of the Ostyak women on the Obi, and the dress of the Cheremisses, Chuvashes, and other Finnish races. The women, themselves, were smaller and more delicately formed than any whom we had seen hitherto among the mountain Tunguzes. Their complexion was fairer, and the expression of their face very peculiar, owing to the unusual shortness and slenderness of the nose. The under jaw, also, was so strong, and projected so much, that it looked as if it did not belong to the upper part of the face.

I ventured, here, to ask some questions respecting the religious opinions of the Tunguzes, but learned little more than that they have always, and, "as well

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as the Russians," believed in a God, whom they name Hanki. Moreover, they have always "prayed in their own manner," and they denote their prayers by the same term, *nungdlen*, which they apply to the Russian rite of making the sign of the cross. They were far more communicative, and better pleased, when I asked them to show me the Tunguzian dance, and for this treat I had been taught by my former attendants to look forward to the yurt of the Yúdoma. We went before the door, to a clear spot between the poplars. Then eight men took one another's hands, made a ring, and kept moving in it, sometimes from left to right, sometimes in the opposite direction. They went, at first, by steps, then jumping, and at last squatting on their heels, and ejaculated at the same time, very rapidly, and as if out of breath, the following dissyllables, which begin, collectively, with an aspiration:—

Khódya, Húrya, Hánga, Hónka, Húndi, Hído,
Hóka, Héredu, Húnda, Húri, Kóki.

Each of these words was repeated several times, and every new word was the sign of a new step or mode of movement. The women's dance was then exhibited to us by the two ladies of the yurt, and some men, who assumed the place of women; but they took care to inform us that this was never done when the dance was regularly performed. They formed in like manner, a ring, but so that each laid her hands on the shoulders of her neighbour; they hung down their heads at the same time, and endeavoured to hide them completely in the middle of the ring. They then moved in the same manner as the men, only always by steps, and called out the word *nurgen*, alternately, with an inarticulate, extremely singular cry, resembling the squeaking of mice, or of a young pig.

I have not yet mentioned that here, with the Tun-

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guzes of the Aldan mountains, as among the Kamchadales also, the paper money of the Russians is either unknown or quite valueless. Instead of it, they demanded, in payment of all the services which they rendered us with their rein-deer, *súkhari* (or biscuit bread), and butter; and I had only to fear that the diminution of my stock of provisions might oblige me to be very economical in the use of this new kind of coin. A young Tunguze, too, asked me here for some present; he said he had no rein-deer of his own, and, therefore, would not be allowed anything out of the posting money. Yet he refused to let me have his tinder case and sulphur box for a large piece of butter, observing, at the time, that he could do without the butter, however he might long for it, but that he might die if he were but a night without his fire tools.

The country round Yudomsk was embellished, today, by a gleam of spring weather; for, after the snow had ceased, the sky cleared and became dark blue, and the purest sun-light fell on the rocky sides of the valley, on the fields of snow between the larch woods and the poplar groves by the river. The air, at noon, had now risen to a temperature of +6° R. I made the usual magnetic observations before the door of the yurt. This place must not be confounded with another settlement of the Tunguzes, on the same river, lower down, where the usual summer road crosses the stream. The latter is named Yudomskyi krest, or the cross on the Yudoma, on account of a wooden monument erected there by the earlier Russian travellers. Its position, as given in the narrative of Billings's journey, is lat. 60°·5 N., long. 3°·19 W. of Okhotsk.

The winter yurts of the Yudoma which were visited by us, lie, as the inhabitants assured me, about ninety versts from the place mentioned by Bil-

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lings; and the Russian post carriers estimate the distance from thence to Ancha, of which I determined the position, at 105 versts, and to Ketanda, where I made astronomical observations on the 13th May, at fifty versts. From these data may be deduced the position of the winter yurts on the Yúdoma, viz., lat. 60° 54′ 18″ N., long. 2° 36′ 17″ W. of Okhotsk, or 140° 45′ E. of Greenwich. Its latitude, therefore, differs only by 6′ from that of Ancha; and, in conformity with this result, I remarked that from Tungor to this place we had, throughout, marched nearly due east.

My magnetical instruments engaged, as usual, the attention of the Tunguzes; but they were very quickly forgotten to-day for another and more important sight, for a flock of wild geese, with a loud cry, passed for the first time this year over Yúdomsk. The men, in the greatest delight, pointed them out to each other, and ran to a favourable point to get a clearer and longer view of them. I learned that they are called in Tunguzian *arebach*, and in answer to my question as to whence they came, the men pointed to the south-east, and said that they were now on their way from Okhotsk, having come over *the great water*. This was the first indication I met with among the Tunguzes of an acquaintance with the ocean, for the sight of which I was longing; and soon after, another followed, which seemed a favourable omen. As they were loading our rein-deer, the men of Yúdomsk raised, with laughter, the well-known cry of seamen pulling together, and seemed pleased that I understood their fun. This place is, in truth, but 120 nautical miles from the sea coast, though wholly unconnected with it by any river. The region of the Aldan mountains forms for Eastern Siberia so singular a water-partition, that even the Yúdoma belongs to the domain of the Icy Sea. Its water passes through the

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Maya and the Aldan into the Lena, and by this into the Icy Sea, after running a course of 1200 miles, or ten times the distance, at least, of its sources from the great ocean at Okhotsk.

We left Yúdomsk at noon, and went over only about sixteen miles of very hilly country, for our rein-deer tired to-day much earlier than usual. It struck me forcibly on this occasion, how the passion for their favourite drink increases under such circumstances. There need be no fear of the rein-deer running off, if the traveller dismounts in the middle of the wood, and lets go the bridle; for the deer, in that case follows its rider with visible longing, and, should its desire be satisfied, it appears to have acquired new strength, and proceeds with more life and spirit. Probably, those effects on the rein-deer are attributable to the ammoniacal salts in the human urine, since similar constituents are prescribed by our physicians to strengthen the nerves. However that may be, it is manifest that the Tunguzes and Samoyedes are in the right when they account, as their chief means of taking and taming their beast of burden, this passionate instinct of the animal itself.

We rode across the ice of the Yúdoma close to the yurt, and then up through rocky glens, which cut transversely the mountain lying before us. The bottom of these waterless valleys is much inclined, but we met in them with many step-like horizontal stages, where they open into depressions which lie parallel with the strike of the mountain. On one of these elevated plains also, we found a lake, the environs of which called to mind the ice lake of Kapitanskyi Sàsyek. It does not appear, however, to be so remarkable, for the Tunguzes had no name for it. Here the rocks still consist of slabs of that greywacke resembling clinkstone, which I mentioned before, and which again alternates with thicker strata of coarse quartz

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conglomerate. The strata are steeply inclined to the west, and plainly visible, as well on both sides of the mountain, which we rode across to-day, as on the ridge itself.

From this we saw again, towards the east, the same chain of naked rocks, which, when viewed from the Kapitan, were distinguished from all the rest by their pointed summits. The Tunguzes told me that they lie beyond Ketanda; and, as I had previously conjectured, it became now quite evident, that they are completely separated from the greywacke group of mountains by a plain. We rode downwards over a well-wooded country, which exhibited, however, the effects of a great fire, for the trunks of the larches were completely burnt down over extensive tracts, while others were charred round by the flames, which had seized only on the grass and brushwood. We then came, five versts beyond the half-way between Yúdomsk and the yurt of Ketanda, to a plain in which we found the ice of a rivulet between low rocks of greywacke. The stream had here a southerly direction, but turns afterwards, as my companions informed me, eastwards, at Ketanda, to join the greater water, and with this flows into the sea of Okhotsk. It was the first affluent to this sea which we met with.

Here we let our rein-deer feed, and we staid till morning, round a watch-fire, on the right bank of the rivulet. A very trifling object now kindled the admiration of the Tunguzes to the highest degree. They had never seen peas before, and when I gave them some to boil, they supposed them to be dried fish-roe, but wondered at its being so much harder and less transparent than what they prepared themselves.

May 13. — To-day we rode till noon, twenty versts, as far as Ketanda. The weather was extremely agreeable, but under the bright sunshine the snow-covered

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ground was so dazzling, that it was impossible to dispense with snow-shades even in the woods.

The Tunguzes showed me, as we dismounted on the way, the larvæ of the gadfly, with which almost every rein-deer is tormented at this season. But those of Yúdomsk suffered in so especial a manner from this cruel law of nature, that it was evidently on this account alone that they tired so much more quickly than usual. I had already remarked that some of the rein-deer trembled violently whenever they were touched with the staff or the heel, and thought at first that this was the result of an instinct calculated to protect them in some degree in summer from the fly; but they do it, in fact, rather to rid themselves of the oval-shaped larvæ, nearly an inch long, which are at this time fully developed in the cuticle, and reach to the flesh. The spots where these lie are well covered with uninjured hair, but are raised a little, and after a little practice one can perceive that the sides of some rein-deer appear curled, only on that account. The animals are well pleased to have the hair plucked out from these spots, and they shake themselves immediately, with such force that they fling the larvæ out of their skin to a distance of some feet. The Tunguzes denote the rein-deer fly, or at least its present state, by the word *kuit*, and they tried to make me understand more perfectly the suffering of the animals by rubbing jocosely on my face the prickly surface of one of the expelled worms.

Directly in front of the station of Ketanda, we rode across the river of the same name, on the right bank of which were standing the frames of some summer tents. The little log-yurt in which we remained till the following morning, lies on the other side of the river, surrounded by most beautiful tall-stemmed poplars. Their boughs even now formed so shady a

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cover, that I had some trouble in finding an open spot where I could make my observations of the sun.

This settlement is, taken altogether, one of the richest which we have seen as yet, inasmuch as it lies high enough to admit of keeping rein-deer, and, at the same time, in the vicinity of the most favourable places for fishing in summer. The owner of the yurt, therefore, remains settled, and in the same abode, all the year, and maintains a brisk trade with the Tunguzian mountaineers, properly so called, that is, with those of his countrymen who dwell west of the great water-partition, on the rivers belonging to the domain of the Icy Sea, for in these are found none of the migratory fish. At present, several families from the mountains had settled themselves in summer tents, lower down on the Ketanda; and I had some conversation with the men, who rode off immediately in full trot on their rein-deer to pay me a visit. They welcomed me, offering their hands, and made the usual inquiries after "the lost star." These people, too, had some knowledge of the sea, and as I was showing them how their knives and fire-steels affected the magnetic needle, I could perceive that the compass was not new to them.

I had begun, about noon, to measure solar altitudes, when a number of light clouds, driven fast by the west wind, began to form. The air cooled down to +1° R., and snow fell for sixteen minutes; then the clouds dispersed again, and the evening was clear with increasing cold. I have never seen snow in such perfect and variously-formed crystals, as during this short and sudden storm. Each grain fell single, and among the few which settled on my instruments I could distinguish six different forms; doubtless many more remained unobserved, for my attention was drawn in the mean time to a more wonderful and quite novel phenomenon. Many of the crystals began

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to melt the instant they touched a solid body, and some, as it seemed to me, melted while falling through the air; but this was followed always by a new congelation, the grain of snow assuming, not its previous form, but another more complex. The most complicated forms, indeed, were comparatively rare; but those transformed under our eyes, were so predominant, and presented a spectacle so full of motion, that at last we could hardly help imagining them to be endowed with life. In fact, it is only in the case of living beings that we are accustomed to witness such mysterious changes without inquiring after the forces that produce them.

May 14. — I found the height of the Ketanda, at the winter yurt, to be 2745 feet above the sea, and yet that stream reaches the sea in conjunction with several other rivers at Okhotsk, or in a straight line, about ninety-six miles from this place. This enormous fall, however, seems to be moderated a little by the winding of the river, for the winter road which the Tunguzes generally choose in the most direct line possible, led us for only a short distance along its valley.

We left our night station about seven o'clock in the morning, with a perfectly clear sky, and a temperature of — 5° R., and rode at first over a wide plain, on the eastern border of which rose rocky mountains, like a perpendicular wall. These were evidently the mountains which had been recognised from the Kapitan, and still more plainly from the last pass east of Yúdomsk, as a separate and independent chain of the Aldan system. They appeared at first continuous and undivided, but as we came nearer they resolved themselves into two separate groups; and then we turned suddenly into a cross valley, or, more properly, a fissure in the mountain. Its bottom inclines steeply downwards, and it is fenced on both sides by cliffs,

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sometimes quite naked, sometimes rendered less abrupt by the heaps of fragments lying beneath them.

Here there was no trace of stratification in the rocks, but only clefts which divided them into perpendicular columns. They consisted of a pure porphyry, containing, in sea-green, dense feldspath, yellowish white hexagonal columns of the same mineral. Thus, at the eastern declivity of this wide mountain region, we find a rock which was originally a melted mass, and the first rock met with which has any connection as to cause, with the steep upheaving of all the strata hitherto seen.

The sides of the narrow fissure by which we entered into the porphyry formation, rise in many places to the height of 850 feet above the plain of Ketanda, or 3190 feet above the sea. We afterwards found them much wider asunder when we came to the descent. Even here, thick larch woods have taken possession of every plain of any extent between the rocks. They were burnt down, however, over wide tracts, while in other places less destructive marks were left by the conflagration, respecting the origin of which I could learn nothing. The Tunguzes could only state that it was a long time ago, and in summer, that it broke out, but they knew not whether it took place contemporaneously with that fire, the devastations of which we had seen on the 12th of May, forty miles west of this place. Here, in the burnt tracts, were to be seen, also, the traces of a storm from the west, which probably raged at the same time as the fire. All the taller larches were torn up by the roots, and laid parallel one to another, with their tops to the east.

We had ridden seven hours from Ketanda, towards the E.S.E., when we found ourselves again in the midst of crags of porphyry. These rocks differed from those which we had seen in the morning, only by

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containing black hornblend instead of the iridescent feldspath. The mass of the porphyry is of the same colour and constitution, exactly, as that on the border of the mountain towards the plain of Ketanda. We came, soon after, to a considerable river, which flows to the S.S.E., between the cliffs of the same rock. The Tunguzes call it *Okat*, which signifies, in a somewhat exclusive sense, "the river;" from this word has sprung the Russian name Okhóta, and with it the name, also, of the port of Okhotsk, where the river meets the ocean. The western branch of this chief river of the country is called, by the Russians, the Great Okhóta, and also the Arka.

My entrance into this valley will ever remain impressed on my memory as one of the moments of my journey that teemed most with enjoyment, so suddenly did nature appear to have awaked here to new life from the torpor of winter. We rode across the Arka, and found ice only at its sides; in the middle the stream was flowing rapidly, and with a loud murmur. The water was perfectly clear, and but two feet deep, and at the bottom lay rounded porphyry pebbles in enormous quantities. Poplars and thickets of willow stood on both sides of the river, and filled the valley with a delicious fragrance, which I had never before observed in trees of this kind. It is possible that one may have more sensibility for the enjoyments of spring after experiencing a Siberian winter, than in temperate climates; but it appeared to me as if the flowers of the leaf-trees here have, in reality, a stronger perfume than in Europe; perhaps because, in the course of the short summer, they develop and decay more rapidly, and, consequently, the aromatic particles flow in a more active current. In the middle of the river, three ducks flew whizzing close over our heads, going to some other open waters higher up; and on the bank of the Arka were dis-

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porting two small and very black swallows, which the Russians here call *chernoi vorabèi*, or black sparrows.

On the margins of the valley, smooth porphyry rocks alternated with disintegrated fragments of the same rock, the origin of which was easily discerned. The conical points of the mountain reach down to deep gaps in the ridge bounding the valley; this ridge was once quite even, and now, the parts which yield to the action of the waters in spring, crumble away and are swept down into the river. On these heaps of rubble the snow-drift still lay deep; yet, in some places, budding boughs were to be seen projecting from them.

After we had ridden about three versts down the Arka, on the right bank, we left the river again as it went too far to the south. We then wheeled eastwards, through a glen which leads down to the bottom of the main valley, and came immediately on a Tunguzian tent, where we turned our rein-deer loose, and spent the night. It was of a conical form, like all the tents that we had seen hitherto, and so roomy, as to afford to each of us a good sleeping place, besides those occupied by the six members of the family; but instead of the felt, the rein-deer skin, or the birch bark, which we had hitherto found used for roofing, the covering of this tent was made of fish skins sewed together, like the upper clothing and the boots of the Verkhovian Ostyaks. We found ourselves very snug in this tent so long as the fire was burning in the middle, but as we awakened towards morning, it blew very cold through several broken places in the roof, and I congratulated the owner on the prospect of his being soon able to procure the materials of a new tent from the river.

I had given constant attention, ever since we had been riding on rein-deer, to the remarkable clattering which they make as they go along. It had been

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seldom so loud hitherto as I had formerly heard it on the Obi. To-day, however, it became manifest that this difference depended on the nature of the ground, for as often as we rode in a valley with bare ice, or where the frozen ground had but a thin covering of snow, it seemed as if every rider accompanied the steps of his rein-deer with castanets, and the noise did not diminish till the herd began to tread some inches deep in snow. It might naturally be supposed that the cause of this noise lay in the striking of the hind foot against the long, projecting heel of the fore foot, for it was manifest that on the hard ground the rein-deer quickened their pace, and moved their hind legs more vigorously; I could see, also, on examining their tracks, that the point of the hind foot does, in fact, intrench a little on the marks, which are always plain enough in the snow, of the two smaller toes of the fore foot. Yet it must be observed, that these coinciding footmarks may be made in succession, as well as at the same time; and, indeed, the former alone can be assumed of an animal which is at once so sure-footed and so agile. There can be no doubt, therefore, that the clapping takes place, not on setting down, but on raising the foot, and arises from the striking together of the toes in each pair. Hence it is increased as the pace grows more lively, and ceases completely when the closing of the hoofs takes place in snow. I saw on our way to-day, the tracks of a very young rein-deer. The Tunguzes recognised it to be a fawn of this year, and told me that the deer at Ketanda also had fawned some days before.

My barometer, which I had suspended to one of the poles of the tent, immediately on my arrival, stood, during the night and the following morning, two-thirds of an inch higher than at the Ketanda. We had, therefore, descended about 1600 feet in the course

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of the day, and we were, in the level of the adjoining valleys, only 1160 feet above the sea; that is to say, no higher than on the west slope of the mountain in the valley of the Bielaya, between Chernolyes and Garnastakh. The surprising advance of the spring which we had witnessed on our journey to-day, was attributable, not merely to our approach to the sea, but also to the rapid decrease in the elevation of the ground.

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CHAP. XX.

VALLEY OF THE ARKA. — PROOFS OF ADVANCING SPRING. — CREEPING TREES. — ARKINSK. — APPEARANCE OF SEAGULLS. — THE DOGS. — RUSSIAN SETTLEMENT. — ADVANTAGES OF THE CHINESE TRADE. — DEER'S-HORN JELLY. — EFFECT OF CUTTING THE ANTLERS. — MODE OF SLAUGHTERING DEER. — TUNGUZIAN DOG-SLEDGES. — FERRY ON THE OKHOTA. — IMMENSE HEAPS OF STRANDED FISH. — THE VALUE OF A BEARD. — META. — YAKUTIAN SETTLERS. — A BEAR HUNTER. — THE CHUKCHI AND KORYAKS. — YELAN. — APPROACH TO THE SEA. — DIMINISHED ATMOSPHERIC PRESSURE. — DOG-FEEDING. — OKHOTSK.

May 15. — I LEARNED, in the morning, that our hosts had but recently come here, with their rein-deer, for the sake of the fishery, but that they lived in winter in the log yurts of Amgika, ten versts east of the Arka. They are the last in the direction of Okhotsk who possess an entire herd of rein-deer, and, therefore, we needed their assistance to enable us to continue the journey. I remarked on this occasion, as I had previously done in Ketanda, that the fishing Tunguzes, in consequence of the bartering trade, which the nature and position of their summer abodes lead them to engage in, and of their more frequent intercourse with the Russians, are more quick witted, and, at the same time, less generous than their fellow-countrymen in the mountains. They take more pains, too, than the latter to learn Russian words, and I was able to make myself understood to some of them without an interpreter. After making some difficulties, they agreed to accompany us, with twenty rein-deer, for one day's journey, to the nearest dog-owners, and this for two pounds of butter and a little heap of biscuit, which I laid at the feet of the master of the

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yurt. The whole family sat down immediately round this eatable post hire, and it was all devoured before the journey was begun.

The men here, asked, also, much more urgently and eagerly after a number of European productions. The moment I entered their tent, they told me that they liked the *tsimut*, that is, in Tunguzian, the snow shades, which I wore, better than their own. These were, however, common silver spectacles, before the glasses of which I had tied on the Yakutian net of black horsehair. Then they demanded snuff, which, like the Russian Siberians, they call *proshki*, or dust; and they particularly wished to get hold of my brass pocket compass, which they supposed to be a snuff-box. They could not comprehend how, with such a quantity of things, I should yet be without any of the articles which the Russian merchants bring with them in summer. They asked for needles, for powder and lead, for tobacco, or for a looking-glass, at least. They begged hardest, however, for flints, and this they did even after (yielding to the all-powerful temptation), they had unscrewed and appropriated, as I subsequently discovered, the three flints which were in my firearms. Although I was obliged to deny all their prayers, and to allege my poverty, we still continued the best friends, and the sprightly humour of the Tunguzes still shone more brilliantly than ever.

I procured, here, some of the larvæ of the rein-deer fly, to preserve them in spirits; and this, again, gave the Tunguzes fresh opportunity for joking. They at first refused to bring me any, excusing themselves with the word *grieshno*, "it is sinful;" the ridiculous frequency of which, in the mouths of the Russians, had caught their attention. "By force I certainly should not get any *kuit*, or fly; for the herd, with all that was in them, belonged to them." But as soon as

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I ceased to demand them, every one who went in front of the tent, where the herd was already collected, brought me a handful of larvæ, asking, at the same time, jestingly, if I had enough. These were all of the same size, and of oval form, and differed, like the larvæ of butterflies at different stages of maturity, only in colour, which varied from yellowish-white to dark brown. Then one brought me a larva which was of the same length as the others, but of only half the thickness, and of nearly cylindrical form. The Tunguzes told me that this kind is called *Arabgon*, and is found under the rein-deer's tongue. They maintained, also, that it is extremely rare; but this was in jest, for as soon as I promised to give an iron buckle of my saddle bags, which they had begged for repeatedly, for a number of them, they were able to bring me five specimens in a few minutes.

I saw, indeed, at the beginning of this day's journey, that this second kind of larva is lodged in the throat of the rein-deer, for many of the deer which we were riding began to cough if they were allowed to stand for a few minutes. They then set their mouths open upon the snow, and in every instance I found at the spot where this was done, a longish worm enveloped in some white mucus. Whether the flies which deposit their eggs in the roots of the tongue, penetrate through the nose, or directly at the animal's mouth, I was unable to learn. Here the *kuit*, or skin-grubs, were so extraordinarily numerous, that many of the rein-deer showered them, like hail, on both sides, if the rider, dismounting, only tickled them a little with his staff to make them shake themselves. It is probable, indeed, that the spring weather of the last few days had hastened the maturity of the grubs, so that they were more easily expelled now than at the beginning of our journey among the Tunguzes; yet the traces of them could hardly have escaped my

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notice so long, if it were not that the rein-deer of the mountains are much less liable to the attack of the fly than those which, even in summer, are in the vicinity of the low valleys.

We rode to-day, from ten in the morning till eight in the evening, partly over woody mountains in the neighbourhood of the Arka, partly in the valley of the river. From our tent, we arrived in an hour at the winter yurt of the Tunguzes of Amgika. It is situate on the border of a beautiful larch wood, but was now desolate and empty. The entrance and the window lay open, and bright daylight found its way into the interior of the dwelling, which is never the case in winter. The snow was melted around it, and over the dust heap before the door were hovering some flies and a cloud of gnats, which the morning sun had brought to life; they were the first I had seen this year.

Before the yurt was to be seen as usual the provision cellar, which the Tunguzes call *debdakar*. It is generally filled with dried fish, and presents the only resource in winter. At present, however, it was an empty quadrangular pit, and the boards which had served to cover it lay useless alongside. How fortunate that the ice was at the same time thawing in the rivers, and the fishing was about to recommence! In these countries the stomach must always regulate its demands with attention fixed on the coming season, and this is done so perfectly among the Tunguzes, that, without any other measure of time, they can tell by looking at their stock of food, when the hour is arrived for going forth to their summer occupations.

The further we rode on in the forest, the more frequent were the places where the snow was melted, or at least was melting. Some of these more elevated plains were still covered with rein-deer moss and with luxuriant clusters of other lichens, which only 200

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feet lower, and a few miles further down the Okhóta, may be sought in vain. On some of the plains we saw spots of beautiful verdure. These were vaccinia, which had lived under the snow, and now, at the first thaw, formed a ready-made carpet of vegetation, and tufts of ledum, with newly developed buds. Here it was obvious how much these coriaceous plants conduce to the rapidity with which the summer sets in in these countries; it was also easy to perceive why the vaccinia in the level woods take possession only of the little hillocks round the trunks of trees, or covering stones, and the like; for these alone rose dry and verdant above the plashy level, but around, under the snow water, there was nothing but bare earth.

I remarked a still more singular kind of verdure for the first time, on a woody hill in the midst of much deeper snow. This proceeded from small twigs of a tree of the pine kind, which seemed disseminated separately on the white ground, just as if they had been scattered there by the wind, or like the twigs left behind when a tree is felled. I should have considered them as such, and taken no farther notice of them, if it had not been in a larch wood, in which there was not to be seen elsewhere the least trace of green. We first detected their origin as we were riding down the southern slope of a steep mountain, for there we perceived between those singular shoots something like trunks connected with them, and lying on the ground in the manner of creeping bushes. They were only about three inches in diameter, but ten or twelve feet long, and were straight and slender, several of them proceeding from the same root. In winter these remarkable trees are hidden so completely beneath the snow, that one may ride over them in the larch forest without even suspecting their existence; but it was evident, even now, that in the warm season they rise almost perpendicularly upright,

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for on the steeper banks, from which the snow had completely disappeared already, they had raised themselves considerably in a few days, while at the foot of the same mountain they were only showing their first shoots. They were twigs of this kind which we saw yesterday projecting from the snow in the valley of the Arka. In this creeping plant we may recognise a variety of the Siberian cedar (*P. cembra*), which we had seen on the Obi, as far as the polar circle, and eastwards in the valley of the Lena, always with the most superb trunks. The cones of the creeper are but half as large as those of the true Siberian cedar, but they contain nuts of equally good flavour, and are on that account collected by the Russians.

This kind of growth is designated, both in the case of the stone-pine, and of other trees, which (in Kamchatka particularly) incline to the same character, by the picturesque expression *slanetz*. This is derived from *stlat*, which, like the Latin sternere, and the Greek στορεῖν, signifies to spread, to lay a bed, or anything of that kind; and hence the word *slanetz* is applied also, in the old and popular language, to any slaty rocks; thus recognising in them that origin which geologists have learned to assign to them only since the time of Werner.*

Wherever we rode to-day along the Arka, or across it from one side of the valley to the other, the effects of the rapid thaw were visible. The stream was quite free in the middle, and at the sides the thickness of the ice, though it varied considerably, was every where much diminished; it was very smooth and transparent, and I saw beneath it an astonishing quantity of flattened air bubbles close together, and collected, as it were, into a continuous stratum.

* Thus the Pinus Cembra variet. humistrata, is called Kedrovoi slanetz; Alnus incana humistrata, Olkhóvoi slanetz; clay slate, Glíninoi slanetz, &c. &c.

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Where the ice was thinnest, they were a foot in diameter; and a constant crashing was heard in such places under the feet of the rein-deer, as they broke through the thin covering of ice. But the bubbles were always smaller where the ice was strong, evidently because the air was frozen in during the winter, and now, as the thaw advanced, it was liberated and collected at the surface of the water. But this proves directly that the icy covering here is melted *not from above downwards*, but in the opposite direction. It might be that the warmer water from the middle of the stream, which was now open, had got to the banks and attacked the ice from below; or, which is more likely, that the sun's rays passed inoperative through the transparent ice, but developed and gave out their heat on its under side, where they fell on the surface of the water.

The sides of the valley are here much lower than we found them yesterday, but consist in like manner of porphyry, which rises in handsome columnar crags above the mounds of weather-worn fragments. It is redder here than above Amginsk, only because the green hornblend separates itself more frequently and in larger portions from the other constituents of the rock. The gravel in the river, too, continues of the same character. I found in it some pieces of the greywacke formation, but much less frequent and much smaller, as well as more perfectly rounded by long rolling, than the porphyry pebbles. They arrive here through the Ketanda, which rises in that part of the Aldan mountains, and is already a considerable river, when it enters by a cross valley the porphyritic range.

Just below the place where we crossed over the Arka a second time to its right bank, the rocks were to be seen quite close to the river. The ice was there broken at the margin, and we, therefore, ascended

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through the next lateral opening to the higher ground on the west of the river. I had left our driver with the luggage far behind, when a Tunguzian rider came direct to me from the wood, in full trot, and saluting me in a hasty and indistinct manner, took hold of the bridle of my rein-deer; he tied it to the throat-band of his own, and then set off with me, as if I were a prisoner, down the river, in the direction from which he had arrived. I let him have his way, for doubtless they had heard in Arki of our arrival, and thus had me carried off out of mere friendship; my dog, too, followed us without showing any mistrust. We rode for at least half an hour over mountains, on which the elastic stone-pine occurred frequently; its branches had risen considerably, but they were still dripping with the melting snow. The Tunguze then drove our rein-deer skilfully through the swelled brooks, which here flow in all the hollows of the forest towards the valley; and I now saw how the snow runs off in a few days from ground so regularly channelled. With it disappears, at the same time, every recollection of winter. A little before sunset we came to a gentle slope facing the S.E., in a plain bounded by a wide semicircle of snowy mountains, with green stripes of the stone-pine bush. The Okhota flows through this plain after uniting with the Arka, higher up; and now the settlement of Arkinsk, one of the prettiest which I had as yet seen, lay before us.

A number of little rivulets here join the main stream, while others separate from it. They wind through the low ground in level beds, and were now enclosed on both sides by broad banks of rolled gravel, while on the islands between them stood groves of tall poplars, alders, and willows. There was a delicious smell from the flowers and young shoots. The dwellings lay scattered and half hidden in these

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groves. The valley looked as if it had but just come to life, and belonged to a flock of mews which, with laugh-like cries, swept in crowds over every open piece of water. In all this there was a surprising change, to one so long used to the wintry stillness and torpidity of the mountain forests. But there was a certain character of the place, which here received its completion, and the first perceptions of which, at Yúdomsk and Ketanda, impressed me as if I were already acquainted with it. The thought now suddenly struck me that it was Homer's picture of the Island of Calypso which was hovering in my mind, suggested by its resemblance to the dwellings of the Tunguzian fishermen:

"Without the grot a various sylvan scene
Appeared around, and groves of living green;
Poplars and alders ever quivering play'd,
And nodding cypress formed a fragrant shade;
On whose high branches waving with the storm,
The birds of broadest wing their mansion form,
The chough, the sea-mew, the loquacious crow,
And scream aloft and skim the deeps below.

Four limpid fountains from the clefts distil;
And every fountain pours a several rill,
In mazy windings wandering down the hill."*

Thus it was 3000 years ago, under the 35th parallel of latitude, and so it is now on the Okhota. All the influence of climate seemed annihilated, because here as well as there it was the sea breeze that was blowing, and a river descending to the adjacent coast lay in the fore-ground of the picture.

But Arki had also a charm of its own, for among the clumps of wood were to be seen a great number of dogs, distributed in separate packs and picturesque groups. Some sneaked along the stony margins of the rivulets, looking for dead fish, with ears pointed and searching gait; others were sleeping,

* Odyssey, v. 63—67. 70, 71. In Pope's translation, v. 80. &c.

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and many were just awaked, and howled for hunger, or some other grievance. We rode quite across the hollow, till we came to the last of the yurts, which was inhabited by a Kosak, as keeper of the Russian provision store at Arki. Now the dogs began to gather round us growling; they stared with hostile eyes on the strangers; and Hector, who had followed me with unexceptionable fidelity for more than 3500 miles, was in danger of being torn to pieces by his fellows. He was larger and more strongly built than the dogs here, but he stuck close to the heels of my rein-deer, and dared only to show his teeth to his persecutors on both sides. Fortunately, however, our guide, who now came up, thought the pressure of the crowd too bad; he cried out, magisterially, *tsit!* and instantly they were all silent, and went off humbled, and almost creeping with fright. This magical word, however, required to be frequently repeated, for different companies of dogs came to us one after another.

I learned from the Kosak, in whose yurt we spent the night, that the *simoviè*, or Russian winter habitation, at Arkinsk, like many others of the same sort in Siberia, was intended originally to facilitate the intercourse with the indigenous population. The collection of the Yasàk proceeds from these centres, and the Russians settled at them make agreements with the wandering tribes, by which the latter bind themselves to help, with their beasts of burden, in carrying goods, and forwarding travellers. This they are enabled to do, by supplies of flour from the stores which are established at these settlements. At the beginning of the last century there was a law made, that a certain number of the natives should remain permanently, as hostages, at every Russian simoviè; and from these settlers descend many of the Tunguzes now dwelling at Arki. But the latter are become so

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closely connected with the Russians, by marriages on both sides, that they have totally renounced nomadic habits. On the road from Yakutsk to Okhotsk, moreover, all merchandise passing through is searched, and entered at the Russian stations; for the government levies a duty not only on the furs collected, but also on the goods which the trader of Yakutsk pays for them.

We then talked of the elastic stone-pine, and I learned for certain, that in summer they stand almost quite upright, and produce such a quantity of nuts, that supplies of them are sent from this place to Okhotsk, where they are less plentiful. The Kosak of Arkinsk does a more profitable business by collecting the soft horns of the rein-deer which are slaughtered at this season. He gives them to the post carriers to take to Yakutsk, whence they are forwarded by the Russian traders to Kiakhta; for the jelly made of these horns is much esteemed by Chinese gourmands, who pay handsomely for them. Here again, then, is a remarkable example of the extent and singular courses of Siberian barter. It struck us as more remarkable after having seen that, from the polar circle on the Obi, to the Tunguzes of Okhotsk, the Russians everywhere collect the *valuable* furs for the European trade, while they lay by, at the same time, with the greatest care, the tails and claws of sables and foxes, the inferior rein-deer skins, and here also their horns, to exchange them in Maimachen for the finest teas, and woven stuffs for clothing. The indigenous tribes receive, unfortunately, for their co-operation in this barter, nothing but iron studs, leaden rings, flints, and knives; or if, as in the case of the clever Buracts, they do not ask for these, they get coarse tobacco, which is worth but little. Yet it must not be denied that the Kosaks, the post carriers, and others of the Russian promuishleniks and traders,

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fully earn the profits of such a traffic by their indefatigable activity as travellers, for it is only by means of their immense journeys that the vital fluids, as it were, of the immense continent are brought into the general circulation.

The Tunguzes themselves know how to make the jelly of rein-deer horns, which they do by steeping the horn parings in the juices of the animal's stomach, and then pouring hot water on them. They use it chiefly as glue, to fasten the skin under their snow-shoes, and for this purpose they cut a horn from the living deer, as I had already seen done among the Ostyaks. But I observed here that this operation has an injurious effect on the antler which grows the following year, for many of the rein-deer which we rode within the last few days, had, on this account, one of the newly-grown horns singularly mishapen and stunted. The main trunk of it was easily distinguished by a short branch which it had thrown out, as if to form the less antler. But by the side of this trunk, and parallel with it were two or three others, quite as thick, and separated from it down to the root. They formed together a bunch of horns, three inches high and six wide, with a glandular surface; while, on the other side of the head, was a trunk above a foot long, of the usual thickness, and with perfectly regular antlers.*

Our host questioned me respecting the value of some ores which he had received from the mountains, at the sources of the Yúdoma. They seemed to belong to a vein containing compact lead-glance, with copper and iron-sand. The latter mineral is very

* The oft-disputed forester's story, that the antlers which our stags injure by breaking in their conflicts with one another never grow again, seems to be confirmed by something similar among the Tunguzian rein-deer; yet the latter are not so incapacitated for propagating their kind as stags with broken antlers are said to be.

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common in the greywacke of Aldan, and in the slate also which we met with in the valley of the Ancha. The Russian merchants collect in their summer travels a great quantity of sulphate of iron (resulting from the decomposition of the iron sand in the air), which is used throughout Siberia for the dying of leather, and as a medicine in many diseases.

Soon after our arrival, the dogs of Arkinsk raised that general and vehement howl by which they mean to give notice that the feeding-time is arrived. During the working season, that is, so long as the snow is on the ground, they are fed with dry fish, and always get their meal in the evening, that they may sleep more soundly, and, that when yoked for work in the morning, they may be strengthened, without being encumbered by their food. The Tunguzes are very strict in observing this rule, because the dogs, immediately after eating, are always lazy and feeble. The Yakuts treat their horses in the same manner, and at some of the stages where we arrived in the evening, they were unwilling to let us proceed until the horses had digested their food. With the temperate rein-deer alone, such precautions are unnecessary; they feed till the moment of departure, and yet at first starting, they are in the fullest vigour, and capable of the utmost exertion, either in bearing burthens, or showing their speed. The Tunguzes often let them feed on the journey, and in the middle of the day, because they sometimes tire from hunger alone.

May 16. — This morning I witnessed the slaughter of an old rein-deer by the Tunguzes, for it was done before our tent, and close to the spot where I was making my magnetical observations. They tied a strap to each leg, and thus held it in an upright position, until one of them ripped up the belly, and plunged the knife through the midriff into the heart. The head was then cut off. The animal died very

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quickly, and uttered but a single groan. The dogs, on the other hand, which had gathered round in great numbers, raised a terrible and painful howling, as if they were lamenting the victim. It is possible they may have felt a desire to seize upon the flesh, for the Tunguzes took care to drive them away; calling to them was not sufficient in this case, and the óshtol or driving-stick was brought out. Most of them were frightened by the rattling of the iron rings, which are attached to one end of it for this purpose; the more daring were subdued by throwing the stick among them; they then scampered off, whining, both hurt and unhurt.

My Barabinsk dog had made his peace over night with the Tunguzian kennel, and he seemed to have awakened from the melancholy indolence which had come on him gradually during the journey. Here it was quite obvious how much the beauty of the dog depends for its development on the animal's living socially with its species. Most of these dogs belonged, like those of Barabinsk and of the Ostyaks, to the wolf-dog breed with bushy tail; they were all much smaller than mine, and many of them were low like our German shepherd's dog, but they always carry the head erect, the ears cocked, and in expressive motion; they stretch the tail so prettily in running, and display at every step so much agility and animation, that they can hardly be imagined to have a common origin with our solitary house dog.

We left Arki about noon, drawn by dogs, for the first time on this journey. We had about ninety of them, for our luggage and the requisite number of attendants occupied seven long sledges or narts, each of which had twelve dogs to draw it, and generally an outrunner or leading dog also. Each of these vehicles was about ten feet long, and with the dogs nearly thirty, so that our whole train extended a length of more

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than two hundred feet. It is curious to observe how, in the course of the journey from Irkutsk to Okhotsk, the contents of an ordinary carriage had lengthened out by degrees to so remarkable an extent. This was the effect of two different causes operating at the same time, for while the road grows continually more narrow and more difficult, the beasts of burden found along it grow weaker. Thus on the Lena, in the first place, our equipage increased to six times its former length, because the horses were there again yoked *gusem* or goosewise. Then, in the forests behind Yakutsk, it was necessary to substitute for the large sledges, a long row of small ones; until at last we had to change these again, from Amginsk to Garnastakh for a train of fourteen pack horses, which afterwards, in the higher mountains, gave way to a train of more than twenty rein-deer. But all this was but a prelude to the grand spectacle of our seven Tunguzian narts. In shape and construction these are as simple as possible, for in fact they are nothing more than two wide and light wooden tubs, on which a board, which serves as a seat or for holding goods, is fixed on four legs, about eighteen inches high. The luggage is secured by means of a strap, which passes lengthwise over the whole vehicle. At the fore part of the sledge projects a wooden bow, which the Russians here call *baraban*, or the drum, and to which is fastened the central or common trace of the team. To one end of this strong strap is bound a slender bar, which, in yoking, is drawn through a ring in the baraban. The dogs are then yoked to the trace in pairs, so that there are six on each side. Those on the right pull with the left shoulder, those on the left with the right shoulder, by means of a broad girth, which passes obliquely round the dog's breast and back, and is fastened by a slender thong to the main trace. The guidance and control of the

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dogs are managed here, too, merely by calling to them, and by signs made with the óshtol or sceptre of these charioteers. Both kinds of intimation are obeyed with admirable readiness by the leader, who goes free, and then by the dogs in draught. At the word *hogge*, the team wheel to the left, and then if *hott-hott* be called out, and the óshtol rattled, they press forward with double speed, howling through eagerness. To turn to the right, the Tunguzes cry *nana;* they stop the dogs by crying *teù*, and by resting the óshtol at the same time on the front of the sledge, so as to let it plough up the snow. Here the traveller gets a driver with every sledge, and I had in this capacity a lively Tunguze, who knew how to make the most of the few words of Russian which he had acquired.* Thus, with an odd mixture of Kosak pride and Tunguzian irony, he contrived to explain to me, sometimes that he himself, and sometimes that his little puppies, as he called them, were the imperial post-officers of the quarter.

Near Arkinsk we came again on the right bank of the Okhota, which has here a considerable depth. It was thought, however, that for the first part of the journey we should find a better sledge road on the other side of the river; and so we were obliged to cross over at the ferry with all our troop and baggage. The ferry boat was formed of two long and narrow canoes, each hollowed from the trunk of a poplar, and joined, parallel to each other, and eight feet asunder, by two beams. We got into the canoes and laid the narts on the beams between them, leaving the dogs behind to be carried over afterwards. But it

* In Kamchatka none but women travel with drivers, and it is therefore considered as insulting to European strangers not to teach them to drive, and then to let them manage their dogs themselves. In like manner, it is thought becoming here, as well as in Kamchatka, for men to let both legs hang down from the right side of the sledge, while women alone sit with their legs on it.

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was no easy matter to fetch them over, for they manifested, in a very amusing manner, but with great loss of time, the most decided repugnance to this mode of travelling. They howled awfully as soon as they were placed in one of the canoes, and made their escape from it the moment they were left to themselves. At last the ferry-boat was placed a few paces from the bank, and the dogs in couples were flung in. They became silent as soon as the boat began to move, but howled with renewed violence on approaching the other bank. Then the trial was which should be the first to tread on *terra firma;* they jumped upon and over each other in the wildest confusion, and, before the boat had touched the shore, they were all off. The Okhota, below Arkinsk, has a mean current exceeding six miles an hour, for, notwithstanding the windings, boats go in twelve hours from this to Okhotsk, which is ninety-five versts distant by the direct road.

A few versts lower down, and frequently in the following part of the journey, we saw islands in the middle of the river, and on both sides large banks of round pebbles, never exceeding the size of the fist; and in many places the bed of the river was rendered so shallow by this drift, that we went straight across it in our sledges to look for a better path on one side or the other. I found here, besides the feldspath porphyries of the Arka, some true volcanic masses, viz., a trachyte of fine-grained glassy feldspath, with long crystals of augite, and a granitic rock (protogene) of quartz, green talc and white feldspath. They are brought down here by the eastern arm of the Okhota, from that detached, northern portion of the porphyry chain, the particularly sharp summit of which was seen in the east from the Kapitan.

In all the flatter parts of the valley, where the river was more shallow, there was an insupportable smell of

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fish in a state of putrefaction, and on every side large salmon were to be seen just exposed to view by the melting of the snow. On the gravel banks at the water side, they were strewed as thick as possible, and on the islands, which are overflowed in summer, they lay in heaps one upon the other. They were tempting morsels for our dogs, and it was necessary to keep these running at a good pace; yet one of them would every now and then snatch up an enticing bit of fish, and carry it with him, till a stone thrown at him, or the óshtol reminded him of his breach of discipline. But the drivers took from this inexhaustible store some of the better preserved fish, two feet or more in length, to throw to the dogs at night along with the usual dry food.

The fish taken, and the majority of those left, belong to the species Salmo lagocephalus, which is here named *keta*. This fish is easily known by the peculiar vaulting of the head, which does, in fact, like the Linnæan name of the species, remind one of the head of the hare. The jaws are so much bent from each other, that they touch only at the lips. At each side of the mouth, therefore, there is an opening, through which the strong teeth are distinctly visible. Of these ketas, only the young ones born in the river go back to the sea in the course of the winter and the spring, but the old fish, collectively, end their lives as they ascend the stream in the summer, for many of them are taken by the Tunguzes, and all the rest, as soon as they have spawned, die "of age;" so said my companion at least, when I asked him who had killed these countless shoals of fish. In the Okhota there is but one kind of salmon which forms an exception to this general rule; this is the *malma*, or S. callaris, of which the old ones, when they have spawned, pass the winter in deep and quiet parts of the river. There, when the ice breaks up, they let the flood and snow-

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water, and the drifting ice go by, and immediately after return to the sea before the other kinds of salmon have begun to ascend. These alone, therefore, are caught at the mouth of the river, going downwards, in spring, and a little higher up at all seasons. All the other kinds belong to the fresh water only during the first and the last months of life.

The Okhota and its environs were just now most agreeably enlivened by immense flocks of water fowl. My driver told me that they had arrived here only five days before. He directed my attention to the seamews, "how they call and laugh at each other." They flew singly, but the moment one plunged upon a prey, there was a cry like yelling laughter, and another hastened to share the spoil. On the broad and open parts of the river were ducks, which flew thence always up the stream, and in pairs. There were several species of them, but the commonest was the perfectly black duck (Anas fuligula), here called *chernet*, and which, after a few weeks, is no longer to be found in the neighbourhood of Okhotsk. In the evening we saw geese also, in small gatherings, going restlessly up and down, as if they did not know their way, or had not yet decided on their journey. They never make nests here, yet for a few days every spring, and sometimes considerably longer, they are to be seen on the Okhota, perhaps because they have crossed the sea too early and are waiting for favourable weather before they proceed up the country.

To-day there was a heavy fall of snow, and we were obliged to stop twice in the course of our journey on the left bank, to warm and dry ourselves in the yurts of the Tunguzes. Some of these were living still in a log yurt; but another party, with whom we staid longer, were already in the summer tent, covered with fish skin. The top of the tent was open as usual to allow egress to the smoke, but the draught

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from the fire was a sufficient protection against the snow.

One of the women in the tent was suckling her child, holding it to her breast along with the basket in which it was tied. She turned it alternately to both breasts, without once letting go the pipe, with which she was smoking and stupefying herself. These narcotic pleasures, the low fish-diet, and the snow-water agree so well, however, with the Tunguzian women, that they often continue suckling children which are able to talk and run about. In Garnastakh, for instance, I saw a boy of four years old frequently quieted with the milk which more properly belonged to his youngest brother. I had already seen similar examples among the Samoyed women, and had learned from the medical man in Tobolsk, that the Ostyak fisherwomen can give milk at all times, "almost like cows."

The men here gave me some account of their dealings with the traders who visit them in summer. For tobacco, and some other articles, to which the example of the Russians has attached them, immense prices are asked; they pay, for instance, the value of five roobles for the iron rattles on the óshtol. I said to them, with perfect sincerity, that with us, such rude workmanship, would not cost a twentieth part of that sum; yet they seemed not at all surprised, but to be quite habituated to a sense of inferiority, as the consequence of comparing themselves with the Russians. They sought a ground, or a new proof of the superiority of the latter, in the beard, by the want of which the best dressed and best bred Tunguze may be distinguished at once from the genuine Russian, for, as they observed, "they have only a few hairs on the lip."

After resting a little in this tent we set out again, and let the dogs go at a good rate wherever the snow

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was firm; on the frozen margins of the river they went of their own accord in full gallop, and even over naked gravel they drew the nart, slowly indeed, but without ever stopping. At last, at one of those difficult places, which now grew more frequent, the sign was made to them to rest. Each then lay down on the snow in its place, and they were fast asleep when the rattle of the óshtol roused them up and again urged them forward. At last they grew so tired with the bad road and the snow storm, that we made up our minds to spend the night on the left bank of the Okhota, thirty-five versts below Arki, and still ten from the yurts of Meta. We made ourselves a little fire with decayed poplar wood, which had been drifted here by the floods of last spring, and then we slept on the dry stones as soundly as our dogs.

May 17. — The snow had ceased during the night, yet the sky was still heavy, and seemed to portend a return of bad weather. Here, again, I saw some low porphyry rocks close to the left bank of the river, which lower down, towards Okhotsk, is quite on a level with the plain, and covered only with pebbles. We then went across a half frozen shallow ford, and came soon after to the winter yurt of Meta, which lies at a short distance from the Okhota, in a noble larch wood, and takes its name from a brook which joins the main stream a little lower down. Like the yurt of Arkinsk it is inhabited by a Kosak, but round about it lie several other log yurts, which belong to Yakuts. This tract in general, and, as I understand, the right bank of the river down to Okhotsk, are peopled by small communities of this race, who have settled here partly as exiles and partly of their own choice, and as the result of the summer journeys which they make with Russian merchants over the Aldan mountains. They possess no horses, but have

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not been able even here to do without horned cattle. Most of them adhere to their original customs, and keep their cows under the same roof with themselves. But a yurt which we passed just before we came to Meta, was encompassed with a quadrangle of cow houses, so large and regularly built, that it bore the closest resemblance to a European farm-house. The dogs, too, round this dwelling were remarkably handsome. It belonged to a Yakutian knyásetz, or chieftain, whom the Russians named Tirpyan, and who acquired his wealth by delivering raft-timber for ship-building in the port of Okhotsk. Some of the Yakuts in this place, find that fishing in the Okhota is at least as profitable as cow-keeping.

A delay of some hours took place, while the dogs and sledges were assembled from the yurts round about, yet the time passed without tediousness in conversation with the experienced Kosak with whom we lodged. He had been settled here the last twelve years, and previously he had resided, to collect the Yasàk, at Udskoi, in lat. 55° N., where the river Ud enters the ocean. An attempt is now making to give importance to this most remote and sequestered place, close to the Japanese dominions, by establishing in it a factory of the American Trading Company, and a port for their ships.

Our host had hunted bears with equal ardour and success at Meta and at Udskoi. He assured me that the colour of the bears here varies accidentally only, from brown to deep black; he was of opinion, also, that the black bears with a white neck, so often met with, are not to be considered as a distinct species, any more than the black bears with white heads, which are also often killed in these forests. About this time of the year the bears leave their winter lairs and feed on the buds and young shoots of the poplar. They are little observed, but as soon as the brooding

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season commences, a terrible growling is heard in the woods on all sides. The male then pursues the female with blind fury, and, in their headlong course, they sometimes run over men without doing them any further harm. Should the female be killed during this pursuit, the male embraces her without regarding the cause of her fall, so that the hunter has full time to load again and level at him. It is also said, that in autumn, the bears sometimes tear to pieces the horses of travellers in the Aldan mountains, when they are tied in such a way that they cannot defend themselves with the hoof.

Equally amusing, by their fanatical and superstitious oddity, were the comparisons which our host made between the Russian and the indigenous inhabitants of Northern Asia. I asked him whether, when he was in Udskoi, he was wholly without apprehension on account of his Japanese neighbours, and received for answer, "That even the most barbarous and most powerful of the heathen, feel a veneration for the *Pravoslavnie*, or orthodox Russians, and have nothing more at heart than to be like them. As a proof of this, he related "How the Chukchi and Koryaks, in the Gulf of Penjinsk, begged of the Russian post-carrier, in his annual journey through their country, to lie with their wives, and overwhelmed him on his return with presents, because a son had been born to them from this transient alliance; so anxious are they to improve their race by a mixture of Russian blood.* True believers may be

* It is true that the Chuckchi offer to travellers who chance to visit them, their wives, and also, what we should call their daughters' honour, and resent as a deadly affront any refusal of such offers. But this has nothing to do with the supposed acknowledgment of Russian superiority, for the Chukchi observe the same custom with men of their own race, and expect as much in return. Of the Koryaks, those only adhere to this custom who live without rein-deer, by fishing and bartering, and have become settled. They have lost their herds in war, probably with

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found, also, where no one suspects their existence; for the Chukchi related at the fair of Ijiginsk, that they had seen in America, to which country they sometimes passed over (by Behring's Straits), white men with beards, who crossed themselves before wooden images." Current stories, such as these, serve to show, at least, the opinions and principles of their inventors and retailers.

I learned, also, that no thunder-storm has ever taken place here in winter, at least during the last twelve years, and that they are rare even in the hottest season. But at Udskoi they are frequent and violent. The Okhota still flows rapidly, for the Tunguzian boats drop down in summer from Meta to Okhotsk in five hours.

About five o'clock we resumed our journey, with fresh dogs and Yakutian drivers, who are far from being so expert as the Tunguzes. We went, on account of the heavy snow, only fifteen versts, and staid for the night in a small yurt on the right bank of the Okhota, the name of which signified "The Bear's Head." It belonged to a Yakut, who possessed a few cows.

May 18.—We started early from our night-quarters, going through a thicket of alders and willows on the bank of the river. The dogs found a good path in it, and although the low, entangled boughs were sometimes troublesome, yet they afforded protection

the Chukchi, and have adopted the manners of their conquerors. The rich Koryaks, on the other hand, who are still nomades, are jealous in the extreme, for they punish adultery with death. Their women, therefore, disfigure themselves purposely with ragged clothing, which they wear over their rich furs; for they wish, as they say, to please only their husbands. The Chukchi women and the wives of the settled Koryaks endeavour, on the contrary, to heighten their charms on the approach of strangers, by paint, by ornament, and by stripping the person. Thus we find in the north of the earth every gradation of manners, from the most jealous polygamy to lawful polyandry in the Aleutian Islands. Among the Koryaks the two extremes are accidentally brought close together.

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against the snow, which was driven to-day by a very violent east wind. We then crossed the Okhota again. It was still early in the day when we came to a small yurt, named Yelan or Yelanskaya Yurta, on a naked plain on the left bank; yet the Yakuts were unwilling to proceed further, for in the thick snow, they said, we might go into the sea, which, at high water, overflows the plain lying south of us. We were now but ten versts from Okhotsk.

This piece of information was to me quite unexpected, as I had found the barometer very low even at out last night's quarters on the Okhota, and had thence inferred that we were still at a considerable height above the sea, and much further from it. But it was still more a matter of surprise that even here, too, I found the mercury an inch lower than its mean state on the sea coasts of Europe. It was impossible that such a difference should be the result merely of the east wind that brought the snow, and though the weather improved towards evening, the atmospheric pressure increased but a trifle. Yet our drivers were positive that to-morrow, at the ebb tide, we should reach the port in two hours; and it must indeed be visible from this place in clear weather, for they all agreed so perfectly in pointing out the direction in which it lay, that I determined it with the compass to be 25° south of the true east. Thus I was here almost compelled already to assume that the atmospheric pressure on the sea of Okhotsk, is no greater than the pressure at the height of 350 feet in the middle of Europe.

We enjoyed at Yelan once more the pleasures of a true Yakutian homestead, for we shared the hearth with two calves, and slept at the cow's feet, near the open cow-house door. The owners, however, declared that the stock of cattle here is but a shadow of that near Yakutsk, "because the high sun is more

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injurious than the severest cold," and, therefore, they got from a cow here not more than a quarter of a vedrò, or about two-thirds of a quart of milk a day.*

In the evening I went before the yurt to see our dogs fed for the last time. At feeding time each team is yoked to the trace just as when travelling, and is kept extended by fastening the ends to two pegs, or trees. Then, to each dog are thrown, on his own side of the trace, two long slices of the malma (*Salmo callaris*), which is carried, like the other provisions, in large Yakutian leathern bags. They all eat standing, and holding the fish with the fore feet, and while the food is distributing they manifest no impatience or enviousness. It sometimes happens, however, that when one has finished his share before the rest he falls upon his neighbour. In this case, if the master be near, peace is soon restored by a call, or by rattling the rings of the óshtol; but if the quarrel proceeds to biting, then they are beaten, or the stick is thrown at them. This mode of correction is often resorted to in travelling, and the driver shows his ability in always punishing the guilty dog duly, and without delay. When one of them, through laziness, ceases to draw, or snaps up some morsel found on the way, and carries it with him, the driver throws at him with a stone, or hard snow ball. He then shrinks howling, and is generally thrown down by the others, who run harder for the moment, and is dragged a little way. The Tunguzes seldom throw the óshtol, though they are all expert enough at picking it up from the ground, however

* The vedrò contains 750 cubic inches. It must be observed that the dry and stony nature of the ground round Okhotsk is unfavourable to cattle. In Kamchatka, where more snow falls than at Okhotsk, the grass is so luxuriant that it may be mown three times a year at least. The cows carried thither from Yakutsk are improved by the more abundant pasture, and yield plenty of milk both in summer and winter.

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